FOOD INDUSTRIES

DISTRIBUTION • PROCESSING

McGraw-Hill Publishing Company, Inc.

Thirty-Five Cents Per Copy

JUNE, 1937

Sanitary

Edible Fat Chutes of ENDURO Stainless Steel

There can be no metallic "pick-up" here . . . for the metal is ENDURO—Republic's Perfected Stainless Steel. Corrosion-resisting all the way through, and simple to keep meticulously clean, the food is protected when handled on ENDURO equipment. And profits are protected too; for equipment made of ENDURO remains sanitary and serviceable indefinitely. Specify it for all your equipment needs. For full data, write Republic, Dept. FI.

ENDURO
REPUBLIC'S PERFECTED STAINLESS STEEL
REPUBLIC STEEL

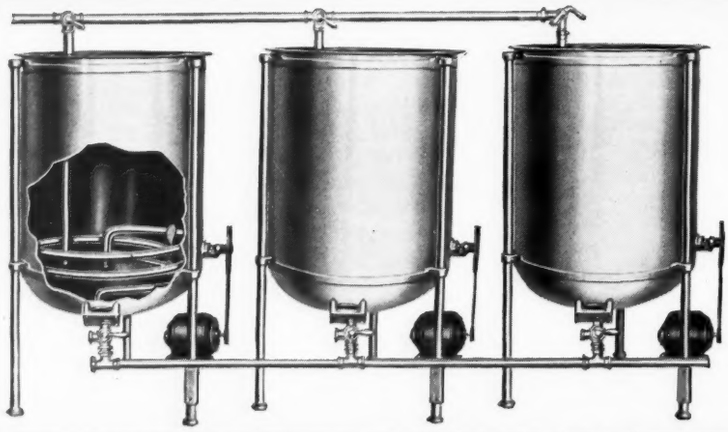
Republic Steel Corporation

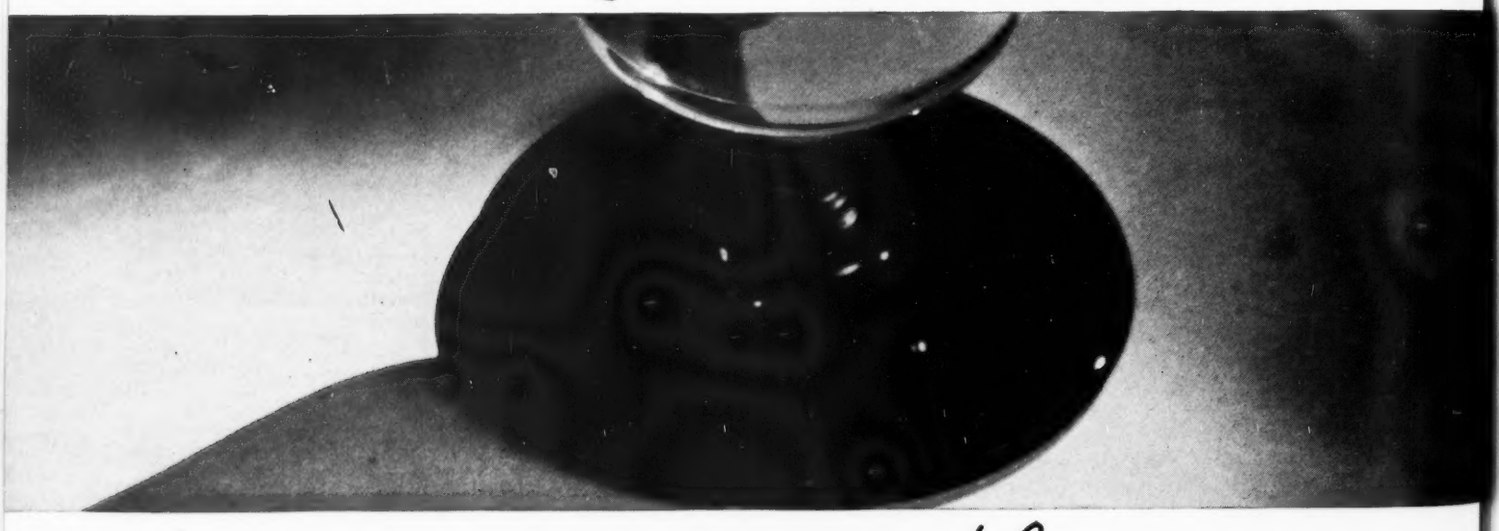
GENERAL OFFICES...CLEVELAND, OHIO

ALLOY STEEL DIVISION . MASSILLON, O.

UNIV OF MICH
GENL LIBR
ANN ARBOR MICH

The Pfaudler "Kwik-Mix" Juice Pre-heating Unit has every feature essential to a quality product at low cost plus these features; easiest-to-clean glass lining; self-draining bottom; fast-heating, quick-cleaning coil; no pockets in either equipment or lines; moderate agitation to accelerate heating and seasoning.





HOW TO KEEP TOMATO JUICE *flavor* NATURAL

The fact that Pfaudler Tomato Juice Pre-heating Unit is glass-lined is of great importance in the handling of such a sensitive product as tomato juice—for the glass prevents the astringent flavors which occur as the result of oxidation in the presence of metals.

The seamless glass lining, which offers no hiding place for bacteria, cleans in a very few seconds. This feature plus the rapid heating coil cuts time from extractor to container to a minimum, still further aiding flavor.

If you want more natural flavored tomato juice, write. THE PFAUDLER CO., G & E Building, Rochester, N. Y.

Factories: Rochester, N. Y.; Elyria, Ohio.
Branches: New York, Chicago, Philadelphia, Elyria, Ohio, (Pfaudler Sales Co.); San Francisco and Los Angeles.

Pfaudler MEETS THE ACID TEST

PFAUDLER GLASS-LINED EQUIPMENT

FOOD INDUSTRIES

DISTRIBUTION • PROCESSING

VOLUME 9, NUMBER 6 PUBLISHED MONTHLY

CONTENTS FOR JUNE 1937

THIS MONTH

Continuous Frying of Potato Chips 304
Development of semi-automatic, controlled equipment has brought this product from kitchen to factory scale production.

The Insect Fragment Count *By W. H. Harrison* 306
Canning of quality foods must be done in field and plant. Laboratory tests are only a check on the effectiveness of control methods.

Self-Peeling Frankfurters 309
New development in sausage packaging makes casings drop off during cooking.

Behind The Stockton Cannery Strike 310
Rival labor organizers caused shut down of California canning plants.

Cheese From a Coal Mine *By L. A. Rogers* 312
Roquefort type cheese can be made successfully in the United States when natural curing rooms can be found.

Flavor in Foods—An A.C.S. Symposium 314
All food manufacturers are compelled to pay increasing attention to the flavor of their products. Important aspects of food flavor are reviewed in this report.

Saving Through Safety *By J. M. Roche* 316
Every food plant should realize that the average accident costs the manufacturer four times as much as the insurance company pays.

Putting Efficiency Into Warehousing *By D. R. Leas* . 317
Millers, canners, preservers, and all other food producers who warehouse their products will find suggestions for saving in this discussion of a Seattle flour operation.

Did You Say 15 Per Cent? *By Ivan C. Miller* 320
First of a series of articles on the evolution of the supermarket.

Planned Economy in Fleet Operation 326
Bakers, beverage bottlers, ice cream makers, meat packers and others using fleet distribution methods will find pointers in this account of how a brewer planned his truck fleet.

Food Industries' Fact Picture 1937 351
Brief presentation of the latest statistics in the food field

Food Production 352
Food Imports and Exports ... 355
Food Employment 356
Food Merchandising 358
Food Prices 360
Food Consumption 360
Food Industries Trends 364
Food Industries Balance Sheet 365
Food and Population 366

EVERY MONTH

Talk of the Industry 301
Comment on things that have happened, and those that haven't but should.

Plant Notebook 328
Corner cutting methods and devices worked out by plant operators.

Answers to Plant Questions 330
How plant operators are solving their problems from day to day.

Discoveries and Inventions 331
Concentrated information about new methods, processes, patents and research work.

New Equipment 332
New tools of production for the food plant operator.

Distribution Hints and Hurdles . 323
What manufacturers and distributors are doing to increase sales of their products.

New Products and Packages ... 324
What food manufacturers are making and how they are dressing it up for sales.

Business Trends 334
Prices, supplies and markets. A month's developments in review.

Keeping Up With the Field 336
Happenings that affect the future of the field. Briefed for quick reading.

Men, Jobs and Companies 340
News about people, plants and companies that make up the food industries.

Book Notes 350
Writings on topics of interest and importance to food men.

Patent Digest 350
A service to those who wish to keep posted on all new patents affecting the food industries.

LAURENCE V. BURTON, *Editor* • LOUIS F. STOLL, *Vice-President* • M. A. WILLIAMSON, *Manager*

E. S. STATELER, *Associate Editor* G. L. MONTGOMERY, *Managing Editor* F. K. LAWLER, *Assistant Editor*

R. S. McBRIDE, Washington, D. C. PAUL WOOTON, Washington, D. C. N. A. BOWERS, San Francisco, Cal. S. T. HENRY, Spruce Pine, N. C.

McGRAW-HILL PUBLISHING COMPANY, INC.

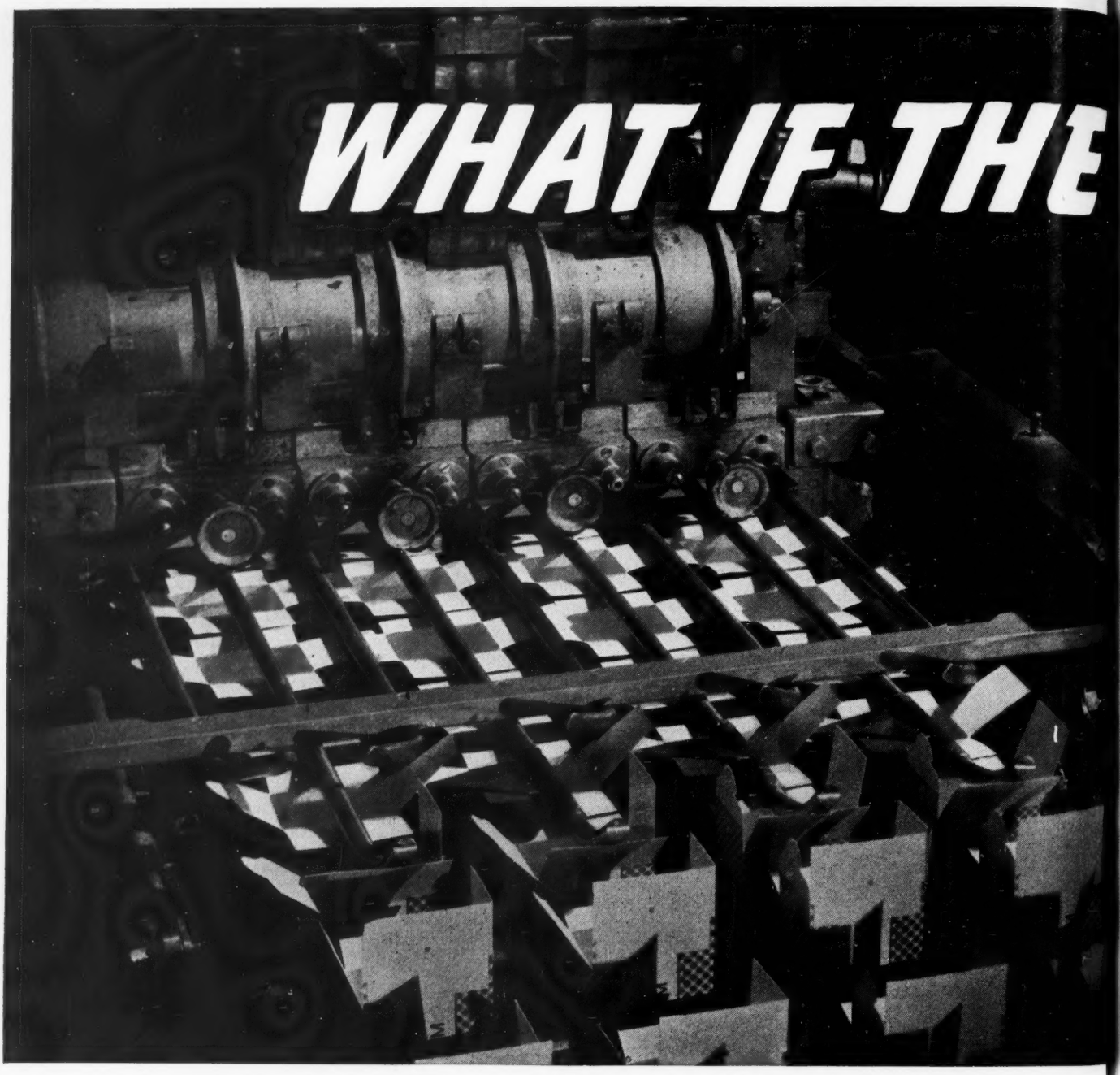
Publication Office: 99-129 North Broadway, Albany, N. Y. *Editorial and Executive Offices:* 330 West 42d Street, New York, N. Y.

Branch Offices: 520 North Michigan Ave., Chicago; 883 Mission St., San Francisco; Aldwych House, Aldwych, London, W. C. 2; Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Atlanta, Ga.

JAMES H. McGRAW, JR., Chairman — MALCOLM MUIR, President — JAMES H. McGRAW, Honorary Chairman — LOUIS F. STOLL, Vice-President — B. R. PUTNAM, Treasurer — D. C. McGRAW, Secretary

Published monthly: price 35c a copy. Subscription rates: United States, Canada, Mexico, and Central and South American countries, $3 a year. All other countries, $5 a year or 20 shillings. Entered as second-class matter Aug. 17, 1936, at the Post Office, Albany, N. Y., under the act of March 3, 1879. Cable address: "McGrawhill, New York." Member of A.B.P. Member of A.B.C. Contents indexed monthly in the Industrial Arts Index.

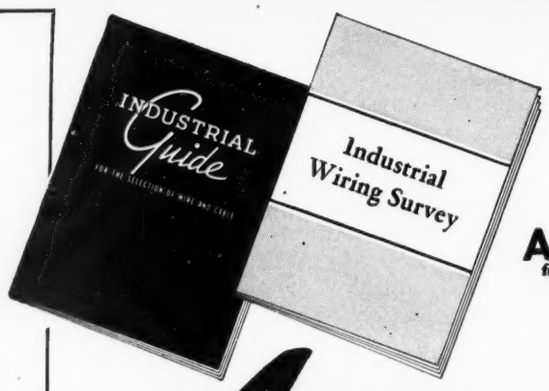
Copyright, 1937, by McGraw-Hill Publishing Company, Inc.



Two important books which you should have

One is our "Industrial Wiring Survey." This volume tells you how to initiate a scientific check-up of electrical circuits. It simplifies the problem surprisingly.

The other is our "Industrial Guide for the Selection of Wire and Cable." Brand new, it is the only thing of its kind in the electrical industry. Scores of situations are described and an engineering recommendation is given for the correct wiring solution of each. Write for your copies.

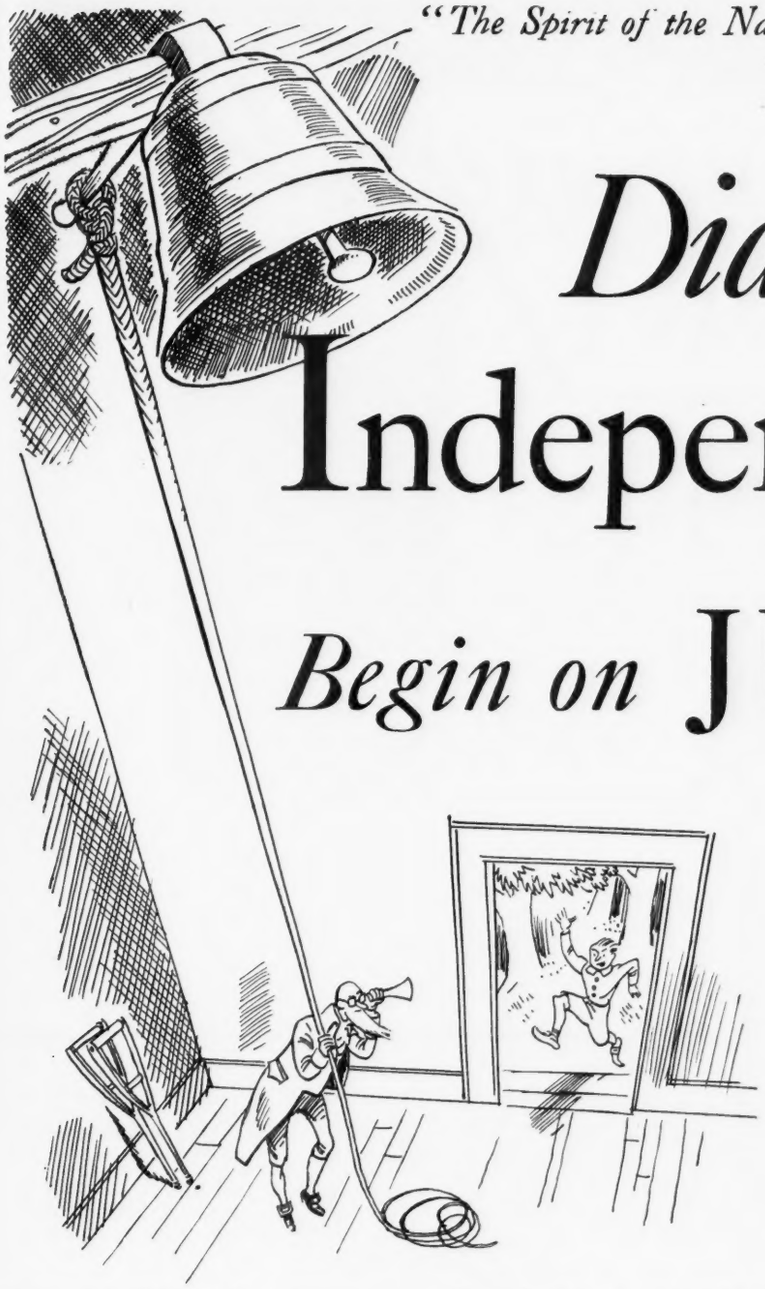


ANACONDA
from mine to consumer

Anaconda

General Offices: 25 Broadway, New York

"The Spirit of the Nation"



Did Our Independence *Begin on* JULY 4?

WHY didn't July 2 become American Independence Day instead of July 4? Maybe the real start of our independence was on June 7, 1775, when Richard Henry Lee of Virginia, in the Continental Congress, moved the adoption of a resolution which declared: "That these United Colonies are, and of a right ought to be free and independent states, that they are absolved from all allegiance to the British Crown, and that all political connection between them and the state of Great Britain, is, and ought to be, totally dissolved."

This resolution, seconded by John Adams, was adopted on July 2. The next day, Adams wrote to his wife: "Yesterday the greatest question was decided which ever was debated in America. But the day is past — the *second* day of July, 1776 will be the most memorable epoch in the history of America. I am apt to believe it will be celebrated by succeeding generations as the great anniversary festival."

The formal Declaration of Independence, drawn by Thomas Jefferson, had been presented to Congress on June 28 and was adopted on the afternoon of July 4. But most signatures to it were not made until August 2. Meanwhile the personnel of Congress had undergone changes. Seven who signed the Declaration had not been members of Congress on July 4 and seven who had been members then did not sign it at all. There is no authenticated historical record of any outburst of celebrations in Philadelphia on July 4. The official celebration was on July 8 and on that date, rather than on July 4, the Liberty Bell was rung. No boy signalled to his grandpa to "ring the bell" on July 4, or later.

Incidentally, the Declaration is usually misquoted. It does not say all men are "free and equal" but "that all men are created equal."

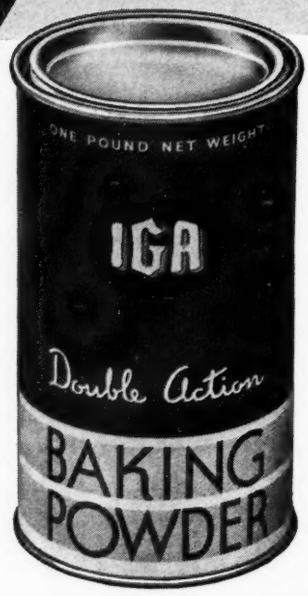
But regardless of dates and incidental misapprehensions, what other American document so completely represents the spirit of the nation?

♦♦♦♦ Science and industry today look to the name of Rossville—"the Spirit of the Nation"—for the finest alcohols the world has ever produced. Write for complete details about the type of Rossville Alcohol best suited for your particular purpose.

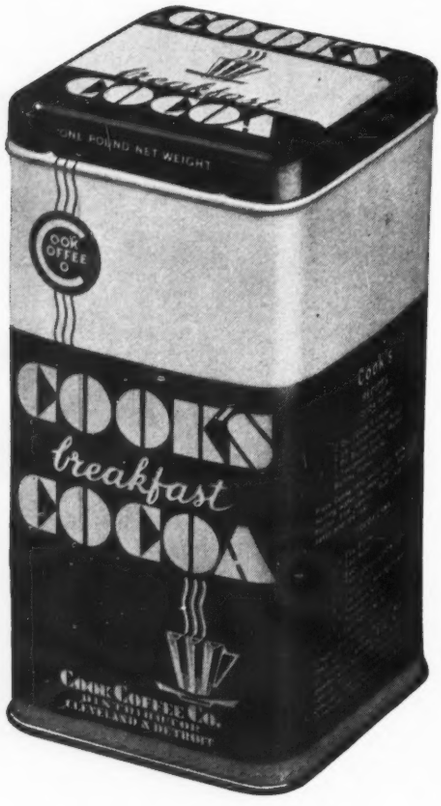
COMMERCIAL SOLVENTS CORPORATION
TERRE HAUTE, INDIANA
DISTILLERS OF
FINE ROSSVILLE ALCOHOLS • "THE SPIRIT OF THE NATION"
BRANCH OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

THESE PACKAGES ARE GOING TO MARKET *Fast!*

Your product can go to market just as fast if you will dress it in a modern container that has a sales talk of its own!



An attractive container that invites the attention of the purchaser is an acknowledged booster of sales. This baking powder can attracts attention and *holds it*. The brilliant lithography, striking in color and design, played an important part in speeding up the sales of this product.



The handsome lithographed design of this cocoa can is modern, smart! The customer gives it credit for able help in increasing sales of the product. Write to Canco for an economical solution to the problem of redesigning *your* package to produce speedier sales.

HERE'S AN UNUSUAL CONTAINER

This package is an example of a "different" problem successfully handled by Canco. Constructed of fibre, it has removable partitions which disclose perforated metal sides, permitting circulation of air through its purifying agent. Attached to the front is a thermometer for convenient checking of the refrigerator temperature.

How difficult is *your* packaging problem?
Why not let Canco solve it for you?

CANCO

AMERICAN CAN COMPANY

230 PARK AVENUE, NEW YORK, N. Y.

104 SOUTH MICHIGAN AVE., CHICAGO 111 SUTTER STREET, SAN FRANCISCO

WORLD'S LARGEST MANUFACTURER OF METAL AND FIBRE CONTAINERS

FOOD INDUSTRIES

DISTRIBUTION • PROCESSING

Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 9, No. 6

Laurence V. Burton, Editor

•

JUNE 1937

The Talk of the Industry

» NOW THAT THE "gray hair" vitamin (B) has been discovered by Agnes Fay Morgan of University of California, there will be a fortune in it for anyone who can produce it commercially. Even this department is inclined to contribute liberally.

» MANY AN EARNEST WORKER, sincerely trying to better his lot, is joining a labor union to give voice to his thoughts, and obtain concerted action a la the Wagner law. And then he frequently finds that all he has done is "join the army." He takes orders—does not give them. It must be a jolt. Employers who are wise in the ways of this wicked world are advising their people to inquire into this aspect of organization before signing up. Also to inquire about reports on what becomes of their dues. Accounting for funds is not considered any business of the ordinary member.

» HOW WOULD YOU LIKE to be a food manufacturer in Germany today? Distribution now takes on a

new aspect under present conditions. Although the government claims there is no food shortage, neither is there any surplus. The problem is to get the right amount of foods to the right stores. So a military survey is being made. Every home is visited and the exact amount of the recent food purchases of each member of the household is figured. That information then becomes the basis of the family food budget. The housewife must decide at what store she wishes to do business and must stick to her choice. On the basis of the consumer survey, the storekeeper is allotted sufficient goods to supply his customers' needs, and no more.

Such an arrangement crystallizes the market for each manufacturer and each store owner and, of course, reduces selling expense to the irreducible minimum. It is said that the real purpose of the new system is to prevent food hoarding—just in case. Ain't dictatorships grand!

» WE SEE BY THE PAPERS that E. A. Filene, of Boston, who sponsors the Consumers Distribution Corporation is planning a cooperative store in Washington, D. C. Evidently Washington is ready for cooperatives —but not Boston.

» APROPOS of the recent labor problem of General Motors in Oshawa, Ontario we are wondering why some one does not propose to keep C.I.O. on this side of the Canadian border in return for a promise from the United Kingdom to keep Harry Bridges at home. Mr. Bridges, you may recall, is the Australian labor organizer who came to the U.S. and kept our shipping on the West Coast all tied up in a knot for quite a spell. One estimate of the cost to American shipping of Harry Bridges' activities in the U.S. is $700,000,000.

» A NEW MARKET for insecticides has been uncovered during a recent marine sit-down strike. The

owners decided to fumigate the ship while it was out of service. It was very effective.

» THE CENSUS FIGURES on the food industries are unusually late this year. Whenever the statistics of the Census of Manufacturers are collected, a year or more must always elapse before the figures are released in consolidated form. In this issue the first consolidated 1935 figures for the food industries are presented. In 1938 or 1939 the earliest figures for 1937 will be available. The extreme delay on the 1935 figures has been largely caused by the government's use of WPA workers on statistical work. Most of their efforts had to be done over again by trained statisticians.

» IT WAS NICE of Mr. Roosevelt to give all of us an advance warning that the bottom would fall out of the stock market a few weeks ago. It

gave us a chance to switch out and in again. If this keeps up we will soon be able to say that the New Deal makes us a profit on our non-dividend payers.

Windfall Tax Flop

IT IS SAID that Secretary Wallace was recently overheard to inquire of the commissioner of internal revenue as to how windfall taxes are coming in. And the commissioner was overheard to admit that up to now collections were practically nothing—something less than $150,000 instead of many, many millions that were expected. The difficulty, if you *must* know, is that nobody who knows anything about accounting, can figure out by the formula in the law how much he has "unjustly" enriched himself.

Help Wanted

A DIRECTORY of frozen food manufacturers is in the process of compilation in our offices. In order to make it complete we ask for help. Please send us the names of concerns which ought to be included. The list should include fruits, fruit juices, vegetables, meats, fish, shellfish, but not ice cream for the latter is in a class by itself. Whether freezing is fast or slow is immaterial.

When it is complete the directory will be published in FOOD INDUSTRIES

Throwing Dust in the Air

SUGAR has again taken a front rank position as a political football in the old game.

Outside the troubles of the sugar refiners themselves, the chief interest of domestic food manufacturers lies in the question: Will my sugar cost me any more, now that the entire world is on an export quota basis? The plan may work out satisfactorily, but one doubts it. If it fails prices may drop in some cases.

So much for the world agreement. Pending in Congress right now are several bills to replace the quotas under the Jones-Costigan Act. One is supposed to be our own domestic method of complying with the World Sugar Agreement. The Administration bill calls for a total U.S. quota of 9,344,350 short tons while the subcommittee bill calls for 9,525,092 tons. The President is dead against the subcommittee bill because it increases the quota for domestic cane sugar and cuts off the 130,000 tons of refined cane sugar from Cuba to U.S. His alleged reason is that the subcommittee plan would saddle $350,000,000 of cost on American consumers without any compensatory benefits.

In vain do we try to figure out where the $350,000,000 figure comes from. Total domestic consumption in 1936 was 12,368,186,880 lb. At ¾ cent a lb. tax, the sum involved would be $92,761,401.60—not the figure nearly four times larger. Benefits to domestic growers would be about $78 millions which ought to leave a nice profit for the treasury.

It must be that there is some reason for throwing dust in the air.

Taste Wins

A GOOD PERCENTAGE of those who confer with us, on various selling devices with which to captivate the imagination of the American public, hope to lure a few of its dollars into the pockets of the food manufacturer. And frequently—perhaps we should say all too frequently—the purely merchandising-minded individual is all coked up about some health angle or health appeal. He seems to think that people buy food for health.

But do they? We doubt it, particularly when they are buying foods for themselves. A mother may buy food for somebody else, especially her children, for their health, but adults and even adolescents purchase food for personal satisfaction.

Invariably we insist that the visitor seeking our advice must answer the question—"Does this wonderful health food of yours taste like *anything?*" And if the answer is not an

Hors d'Oeuvres

• Every morning, 30 million bottles of milk are left on the doorsteps of America. And every evening, the good housewives set 30 million dirty bottles out for the dairies to wash.

• *No limburger cheese was produced between March 15 and May 1 in Green County, Wis., the source of 75 per cent of domestic production. The cheese makers, it seems, were waiting for the public to nibble through the surplus on hand. Needed—A promotion man who can sell smell.*

• Fish sausage has been put on the market in Frankfort, Germany, the home town of the hot dog. Is nothing sacred to the Nazis?

• *What is the better source of vitamin C, orange juice or beans? You're wrong. Which ought to teach you not to jump at conclusions, or something. Green lima beans are equal to orange juice in vitamin C content, it has been shown by studies at New York State Agricultural Experiment Station.*

• Here's a new sales-appeal angle for manufacturers of alcoholic beverages. In the middle ages, sober people intoxicated themselves regularly once a month as a hygienic measure. Far from considering themselves polluted during these periodic sprees, the good people thought they were sterilized.

• *If you have ever wondered how corned beef got its name, you can put your curiosity at rest. This name came from the coarse salt used in curing the beef, this being referred to as "corns of salt."*

• If you are a canner and someone calls you an Appertizer, don't be insulted. The offender doesn't mean that you are an olive, a stalk of celery, a nut or some other form of hors d'oeuvre. Appertizer is a new name for a canner, derived from Nicholas Appert, the French daddy of the canning industry. Dr. A. W. Bitting calls his new book "Appertizing, or the Art of Canning."

• *Lactose is present in human milk to the extent of five to eight per cent. In this respect, human milk and ass' milk are much the same, a point that may or may not be of some significance.*

• If purchased separately from a chemist, the foods contained in a 14-cent quart of milk would cost more than $44. Which either makes milk very cheap or pharmaceutical products darned expensive.

• *In London during the 17th century it was the custom to hire a man to eat bread during a funeral to eat away the dead person's sins. What a set up for bakers—selling bread to the dead!*

• It still is considered something of a novelty to transport food by air. But the first air shipment of a comestible was made a thousand years ago. The Caliph of Cairo craved a dish of the luscious cherries that grew in an orchard about 400 miles away. So 600 carrier pigeons were pressed into service, a small silk bag containing a single cherry being tied to each leg of each bird.

• *More than 300 food combinations are now available in cans. Who says home-cooking offers the greatest variety?*

enraptured endorsement of its flavor, we tell him that he had better start selling something pleasing to eat rather than something which people must be reasoned into purchasing.

Our neighbor, the *National Bottlers Gazette,* has been preaching something of that sort, and some time ago reported a survey of beverage preferences among the youth of the land around college campuses. They discovered that over 70 per cent of students preferred bottled soft drinks because of their taste, the remaining 30 per cent being distributed over price, wholesomeness, and advertising influence.

Here again is a typical example of the fact that when people buy for themselves they buy for their selfish pleasure in consumption and not for any logical reason.

NEW OUTLET FOR FOOD

Scientific studies show that the efficiency of workers is increased by a snack between meals. And most workers enjoy eating frequently. So here is a made-to-order double-barreled demand for foods. A good beginning toward capitalizing on this demand would be made if food manufacturers operated in their own plants "rolling cafeterias" similar to the three used by Westinghouse. These make five trips daily, carrying pie, cake, candy, ice cream, milk, coffee and carbonated beverages.

Please Address Us At New York

THE CORRECT ADDRESS of FOOD INDUSTRIES is 330 West 42d St., New York, not 99 North Broadway, Albany, New York. The latter is the address of the printer which, for some inexplicable reason, the Post Office Department requires us to print ahead of our own address on the contents page. It is very confusing to our friends, yet we cannot do otherwise.

If your secretary addresses us at Albany, it requires about three extra days for us to receive your letter.

Precool To Avoid Disaster

AT THIS TIME OF YEAR there are many concerns which experiment with shipments of perishables, especially those which are testing out methods of preservation by freezing. Frequently it is necessary to transport a carload of perishables to a stationary freezing unit in order to conduct such a test. Last year such a shipment of ear corn went completely bad because the shipper failed to understand the limitations of refrigerated transportation.

Warm materials should be precooled before loading into refrigerator cars, refrigerator trucks or refrigerator ships. The reason for this is that the equipment of the transportation unit is designed merely to maintain a given temperature *after it has been reached.* It is not designed to remove "field" or "orchard" heat, i.e. cool the load from outdoor temperature to, say, 36 deg. F.

Precooling is nothing more than chilling a load to a desired temperature *before putting it into the car,* truck or ship. To do it in a stationary plant such as an ice plant is a whole lot cheaper than to do it in a portable plant—if, indeed, the portable plant is able to do it at all.

Greater Accuracy Needed

ACCORDING TO THE DOPE, the 1937 hog slaughter should have been smaller up to now than it actually turned out to be. Anticipating higher prices in the first half of the year, packers put a lot of pork into cure while livestock prices were still reasonable.

Also the fishing industry did a little anticipating, based likewise on the dope about the smaller number of hogs that were expected to go to market. Figuring on higher prices for competitive pork, the fisheries outfitted in a big way, ran up inventories of frozen fish to 51,000,000 lb., and expected to capitalize on the 1936 drought. This inventory is about 22,000,000 lb. over the five-year average, prices are soft, and the Federal Surplus Commodities Corporation has just been persuaded to purchase 10,000,000 lb. of frozen fish worth $1,000,000 for relief distribution. You can't sell much fish or meat against free fish.

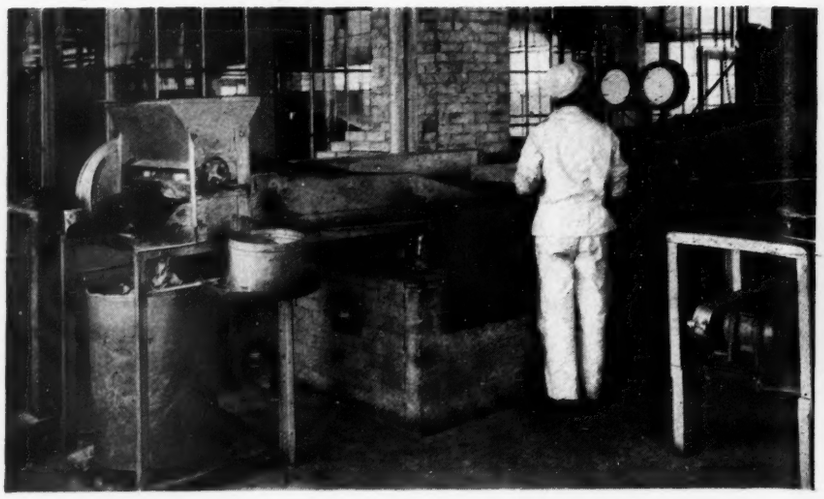
The drought appears to have been oversold. Hogs have been coming to market at a faster rate than anybody expected. Operations in two industries, meat and fish, were influenced by these forecasts. And if the farmers who reported to the Crop Reporting Board slyly colored their observations on the bullish side, the fishery folk have offset any gains that might have accrued. Farmers, meat packers and fisheries have suffered needlessly.

More accurate forecasts ought to be possible—or is this some WPA bungling?

Don't Tear Up Your Magazine

ABOUT FIFTY LETTERS A MONTH come to our offices asking about items that have been recently published, indicating that some article was clipped out for filing away and the rest of the magazine was discarded. This appears to be particularly true of those who save the colored sections dealing with Unit Operations, Market Surveys and the like.

As an experiment and to save your time, we are setting aside fifty extra copies of the colored section which will be distributed free to subscribers who ask for them. If the demand goes above fifty we may be compelled to charge a nominal price to cover postage and handling. It is hoped that this will permit you to keep your back issues intact.



Operated in a continuous manner and under the guidance of temperature recording instruments, a semi-automatic frying machine has changed potato-chip making into a volume and high-quality producing industry.

CONTINUOUS FRYING

Puts Potato Chip Making On Industry Basis

WITH THE ADOPTION of continuous quick frying methods, potato chip production is now definitely on its way to be a food processing industry. In that respect it is similar to candy and ice cream making, cake and pie baking, and other forms of food processing which were done only on a domestic kitchen and small-batch basis even up to only a few years ago. In the matter of age, continuous frying of potato chips is a depression child. It came into being with the beginning of the recent period of low business activity when an experimental, semi-automatic frying installation was developed and put into operation by Ross Potato Chip Co. then of Lebanon, Pa.

The experimental installation proved a success not only for the economic salvation of the Ross Potato Chip Co. now of Richland, Pa., but also for the placing on the market during the past two years of semi-automatic units now built in various sizes for concerns making potato chips on a truly industrial basis.

Through the influence of this improved method of making potato chips a new large volume market for white potatoes has been opened up and the grocer as well as the road-stand and amusement park retailer has a new packaged product for his customers. Also the hostess and the housewife have a new high-quality ready-to-serve food for their menus. In appearance, palate-appeal and wholesomeness the potato chip now has to be taken into account in the competition between foods for a place in the human dietary.

Potato chip frying even as done in the domestic kitchen is not the simple feat that it appears to be. Unless the cook is experienced and knows what precautions to take, the finished chip is very likely to vary greatly in quality. It will probably be grease-soaked, dark in color yet have a raw taste, off-flavored with burnt or rancid fat, or puffed up with blisters that break easily making an excess of crumbs or broken chips.

These results are common even when the production rate of potato chip frying is so low that the cook or chef has the opportunity (1) to hand pick the potatoes he uses; (2) to prepare the slices to his liking for frying; (3) to use whatever fat he wishes; (4) to take the time necessary to heat the fat to the best frying temperature before putting in the slices; (5) to choose the frying time needed to give a good chip and (6) to have the chips eaten within, at most, a few hours after frying.

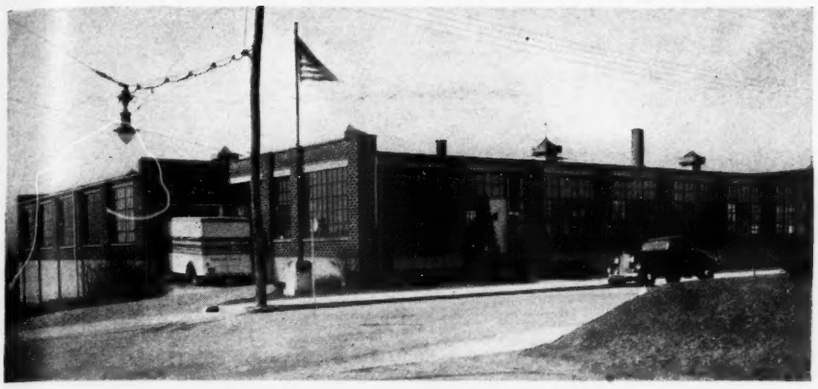
When the frying is done on a commercial scale the chef or operator has less opportunity to give each step in the making of chips his personal attention. He must maintain a production rate to fill his orders on hand. He must use the potatoes supplied to him. He must make as full use of his cooking fat as he can. In addition he must turn out a potato chip that will stay palatable for several days, even weeks, if he wishes to build up an extensive market.

Until the Ross Potato Chip Co. began in 1929 to try out its continuous method of frying, its output was only about 2 per cent of its present production. Yet, for years it had been supplying all the market it could take care of under the batch method of production.

Located in the heart of a heavy potato-producing region, the company had no difficulty in getting an adequate supply of fully matured potatoes as they were wanted. But the company could not gain any momentum nor develop any extensive market for its chips as long as its production facilities were so cramped and there were such wide variations in the chips made by the batch method.

However, during the more than 25 years in which the Ross family had made chips at Lebanon, Pa., by the batch method, it did learn what kind of potatoes made the best chips and under what conditions of preparation and frying chips of uniformly good quality could be made. The difficulty lay in maintaining those conditions from hour to hour, day after day.

The only apparent solution to the problem was to work out a method



Modern in construction, sanitary in housekeeping, and efficient in operation, the Richland, Pa., plant of Ross Potato Chip Co. has set the pace in the "big-time" frying of potato chips.

and means for carrying on all operations and processing in a continuous manner at a production rate which could be maintained 24 hours per day, six days per week, under constant or nearly constant conditions.

The result was the experimental, semi-automatic continuous frying unit, which has since been redesigned and rebuilt many times to reach its present construction. In its original form the unit required so much floor space that the company was forced to transfer its production activities to the building now occupied at Richland. As built and sold to other potato chip makers the unit is more compact and requires less floor space than the one used by the Ross company.

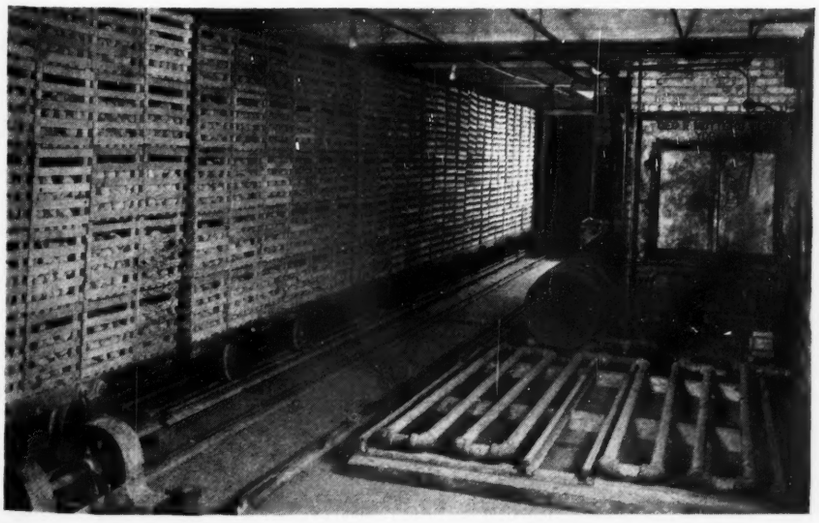
In its integral parts, the unit consists of a mechanical peeler, a combination inspection and washing table, a potato slicer, a slice washer, a draining and a separating conveyor, and a shallow frying vat equipped with a mesh conveyor over which a series of finger-like projections operate in an off-center manner and with a means for automatically salting the hot chips as they are delivered by the mesh conveyor from the frying vat to the receiving container.

The peeler is a standard carborundum-lined unit. It grinds off the outer surface of the potatoes at the rate of a bushel per minute as they are whirled by centrifugal action around inside and finally out of the peeler into which a small stream of water is constantly flowing to wash out all dirt and bits of potato skin.

As the potatoes are thrown out of the peeler, they are carried by a belt conveyor under a water spray and before an inspector who removes all that have field cuts, are off-color or are so irregularly shaped, (known as "doll-babies"), that they are not well peeled. These culls are trimmed, hand peeled, or discarded according to their soundness or fitness for use.

In this plant a bucket elevator takes the potatoes to the floor above, where they are delivered into a feed hopper over the motor-driven rotary cutter or slicer operating through a horizontal plane. The cutting head of this slicer is designed to keep the potato moving along on the cut surface which assures full slices of uniform thickness. The slicing knives are adjustable to give slices varying between 0.035 and 0.065 in. in thickness. Such variations are necessary because the Ross Potato Chip Co. has market outlets for chips with seven different thicknesses. This means that all chips are made to order to avoid keeping of stocks.

Development of rancidity and a "burnt" taste in the frying fat is avoided by periodic emptying and cleaning of the frying vat and by centrifugal clarification of the used fat, which is blended in small percentages with highly refined cottonseed oil before returning to vat in a continuous manner during frying of chips.



For two weeks immediately before use to make chips, the potatoes are heat treated at 90 deg. F. to lower moisture content which otherwise would have to be removed during frying. This treatment follows a four-weeks treatment at 80 deg. F. to get the moisture content of the potatoes to the level that will permit the 90 deg. F. treatment without excessive wrinkling of the skin.

The slices drop directly into an 18-ft. long, 24 in. diameter horizontal revolving mesh cylinder inside a 20 ft. x 30 in. vat through which moves a constant flow of fresh water to remove small bits of potato shreds and starch granules that cling to the surface of the slices. This water also dissolves out most of the sugar content of the slices, which otherwise would darken excessively while the slices were being fried long enough

(*Turn to page* 343)

The Insect Fragment Count

A Problem of Quality Control

By Wm. H. Harrison
Director, Research Department
Continental Can Company

Fig. 2—Fragments of skin of corn ear worm showing fine surface spines, x 180.

WHAT IS THE INSECT FRAGMENT COUNT of a tomato pulp? It is the number of fragments or pieces of insects, regardless of size or shape, which an analyst is able to recover and see when 200 cubic centimeters (about four-tenths of a pint) of tomato pulp are subject to examination in accordance with a specified method of procedure. Since the number of insect fragments found bears an approximate relationship to the number of insects or parts of insects which were in the tomatoes at the time they passed into the pulper, the count of the insect fragments is an index of the care used by the manufacturer in accepting tomatoes and in sorting and trimming them during use.

The Federal Food and Drugs Act specifically prohibits interstate movement of a food if it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance. The Act deems such a food to be adulterated.

Products manufactured from tomatoes which are decayed, moldy, or worm and insect infested, are held to be adulterated if the tomatoes were used without adequate rejections or if there were inadequate sorting, washing, and trimming operations.

In many respects the insect fragment count and the mold count are parallel determinations. High mold count reflects unacceptable conditions with respect to the use of decayed and moldy fruit, while high insect fragment count reflects unsanitary conditions with respect to the use of insect-invaded fruit.

▶ It is to the everlasting credit of the canners that the industry never glosses over its raw material problems by use of nice sounding names. Insect fragments are not "sediment" even if it does take a microscope to identify them.

The technical principles used here, and the courage to face unpleasant facts should invoke a similar spirit in

All Food Manufacturers

Thus, where the food control officials formerly employed only the mold count as the determining test for the quality of tomato products from the standpoint of cleanliness, there are now two methods of about equal reliability. They are so regarded by the Federal Food and Drug Administration, and that Administration will not hestitate to bring action on the basis of excessive insect fragment count alone, should the nature of the samples justify it. It should be understood that a tomato product is considered by them to be adulterated if it has an excessive insect count, irrespective of the reasons for that count.

To the question as to whether the Food and Drug Administration will continue to be as active as it has been in the past with respect to the insect fragment count in tomato products, I feel quite certain that the answer is, "Yes." The F.D.A. policy appears to be to make a preliminary survey of the degree of infestation appearing in the various tomato products producing districts and, where conditions justify it, this preliminary work is followed by more comprehensive inspection of plant practices and the sampling either at the factory, or at the factory and during subsequent interstate shipment, of such packs as were indicated to be of unacceptable quality.

Briefly, the insect fragment test consists in placing 200 cubic centimeters of a well mixed sample in a flask of approximately one-half gallon capacity (Fig. 1). To this is added about an ounce of gasoline and the mixture agitated so as to wet all of the insect fragments with it. (The gasoline has a definite affinity for the insect fragments but not for the vegetable fibers.) The flask is then filled with water and allowed to stand until the gasoline rises, bringing the fragments with it. The gasoline layer is then taken off and filtered through a rapid acting filter paper. The gasoline passes through and the fragments remain on the paper. This is then spread out flat and carefully examined

by means of a low-power microscope. Each fragment on the paper is then critically examined, and upon being identified as a bit of a worm or a bit of an insect, it is counted. The total number of such bits or fragments becomes the insect fragment count of the sample.

The equipment needed, other than the microscope, is simple and inexpensive. The microscope used here is known as the widefield, or Greenough type. Such microscopes are manufactured by Zeiss, Bausch and Lomb, and Spencer. They cost, equipped for this work, about $125. All additional equipment needed can be purchased for not more than $25. The microscope used for the mold counting is not suitable for insect fragment counts.

More time and skill is required for making insect fragment determinations than is required for mold counts. It is difficult to complete the examination of a sample in less than about 1½ hours, and because the work is quite fatiguing to the eyes, from four to five samples a day is about all that one analyst can examine and do good work. Based upon four samples per day, which is about average, and a salary of $5 a day for the analyst, the actual labor cost of an insect fragment count is around $1.25 per sample.

While it is desirable to have an analyst who can make daily checks of the condition of the finished pulp or other tomato product, *the means of preventing the manufacture of objectionable goods does not consist in buying laboratory equipment and employing an analyst to do the work.* On the contrary, it consists in knowing more about the tomato crop being grown for your use and in putting into practice such operations as may be required to properly handle it. And further it involves *installing such factory equipment as will permit these operations to be done promptly and efficiently.*

Critical inspection of the tomatoes will tell whether or not worms are present. If not, no insect fragment counts are needed. On the other hand, if they are present, the counts will tell how effective the sorting and trimming operations have been, and are, therefore, highly important. This statement is made on the basis of two years' experience with the test, during which we have made hundreds of these determinations.

How free from insect fragments should tomato products be, and what counts should be used for guidance in factory operations? Unfortunately, at this time the only figures available are but indicative and are subject to revision at any time. They are based upon the position which the Federal Food and Drug Administration has taken, which position is as follows:

1. That all commercial lots of tomatoes may be contaminated with insect invaded fruit, and the canner should know the degree of the contamination of the fruit he is purchasing;

2. That he should reject all which it is not practicable for him to manufacture into a clean tomato product; and

3. That all fruit which is run should be so handled as to eliminate all objectionable material in so far as that is commercially practicable.

IT MAY BE WELL for the manufacturer of tomato products to be happy over the fact that there are but a few insects which characteristically invade tomatoes, and that the corn ear worm or tomato fruit worm is the only one which is commonly encountered throughout the Midwest region. The other one, known as the tomato pin worm, is rarely if ever troublesome to northern field grown tomatoes.

The records of the insect pest survey of the United States Bureau of Entomology show that no tomato growing district can be depended upon to be free from tomato fruit worms in troublesome quantities.

In the corn belt the tomato fruit worm is well known to all growers of corn and is there called the corn ear worm, the insect which spoils so many good roasting ears for the market gardener, and which in many seasons greatly increases the cost of canning sweet corn. In the tobacco areas, where it feeds upon the tender leaves of the tobacco plant, it is known as the tobacco bud worm. Farther south it is called the cotton boll worm. In the south, it has been troublesome to growers of peas and green beans.

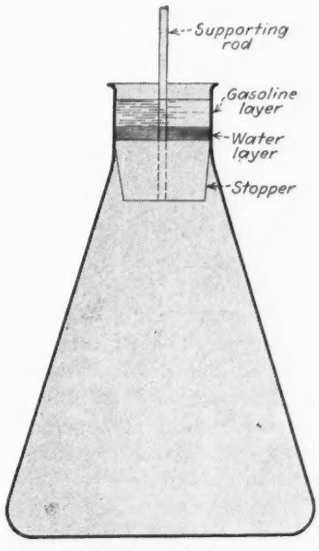


Fig. 1—Flask used for recovery of insect fragments from tomato products.

BUYING LABORATORY EQUIPMENT and employing an analyst to test the products is *not* the means of avoiding production of objectionable goods.

Prevention involves the correct use of proper factory equipment. The laboratory can only tell whether or not the factory did its work well.

In the principal tomato growing sections, there may be three or more broods each season, with increasing numbers as the season advances. The insect feeds on the vines and fruit only while in the caterpillar stage and during the three weeks of growth through that stage sheds its skeleton-like skin several times. It is harmless to tomatoes in the other stages of its life cycle.

The tomato pin worm, which gets its name from the pin-hole appearance of the burrows through which it enters the fruit, is less widely spread than is the corn ear worm. So far as the canning industry is affected, the tomato is the only important crop which it invades. Apparently it is not troublesome to northern field grown tomatoes, but it has caused much trouble in warmer climates and in greenhouse tomato crops in the North. It also feeds upon the egg-plant and related vegetation.

Fragments of cut worms, slugs, the larvae of the tomato tuber moth and gnats have been found in tomato products, but none of these insects presents a serious problem.

In some states, both the corn ear worm and the tomato pin worm have been exceptionally troublesome in lots of tomatoes coming from certain areas. Last year a leading Agricultural Experiment Station conducted studies to determine whether certain of the more commonly used insecticides could advantageously be employed for controlling infestation. Lead arsenate, calcium arsenate, cryolite, and sodium fluosilicate were tried. Since each of these insecticides

is toxic to man, the use of them obviously raises the question of possible spray residue hazard in the finished products. To get definite information as to such possibilities, the National Canners Association West Coast Laboratory made a great many analyses of tomatoes which has been systematically sprayed with these insecticides. Examinations were made of the fruit as delivered to the cannery and also after soaking it for 30 seconds in a 1 per cent solution of hydrochloric acid followed by the customary washing of the tomatoes in a squirrel-cage washer and also washing the tomatoes with water but without the acid treatment. It was found that the acid treatment was not necessary and that tomatoes which had passed through a well operated washer using water alone were sufficiently free from lead, arsenic, or fluorine, as the case may be, to be suitable for manufacture into the customary tomato products.

Undoubtedly entomologists will continue to make progress in insect control and our agriculturalists will effect improvements in growing and harvesting practices but, until both are definitely more effective, the canner must meet the situation with such methods as are available to him at the present time.

Obviously, if a canner is so situated that he is supplied with none but insect-free tomatoes, he has no insect problems to consider. It appears, however, that none is so fortunate, and that all must give consideration to the problem of working with infested fruit.

To attempt to manufacture pulp from very heavily infested stock has been found impracticable. The degree to which fruit may be contaminated and still be acceptable will depend entirely upon the plant facilities available, and the practices used in handling it. In an important tomato canning area where manufacturers have had some little experience with worm infested fruit, a state law and also the machinery for enforcing it has brought some rélief from those growers who attempt to make deliveries of badly infested tomatoes. It is an offense either to deliver or to accept tomatoes which are defined as not suitable for cannery use. The definition of such tomatoes includes deliveries containing more than 10 per cent worm-damaged fruit. Perhaps a 10 per cent limit for unacceptable fruit is too high, as all worm-invaded material must be trimmed away. The resulting shrinkage and labor costs may at times render it unprofitable to operate with such fruit. Vacated worm holes must be considered, for they have been found to contain insect debris. Such holes may also be occupied by smaller insects.

There is nothing new that can be suggested for handling worm infested tomatoes in the plant. Efficiency boils itself down to the best methods of washing, of sorting, and using the trimming knife.

Manufacturers Must Be Prepared for the Worst

It is a sound business principle to keep the investment in plant equipment as low as is practicable, but it is not sound business to minimize investment to the extent that facilities are not available to properly handle infested tomatoes when such are the only stocks available or if, for some other reason, it is a good policy to run them. It would seem that safety lies in anticipating the worst conditions which may be met with in the growing territory and equipping the plant accordingly. It may be too late to put in additional equipment after it has been discovered that your tomatoes are badly infested, in which case you will either have to run infested tomatoes or else shut the plant down.

Dry sorting is advisable when the tomatoes are bad. Eight to ten feet of dry sorting belt should be installed in the line so that it is available for use when needed.

Most washers may be criticized because the water is not delivered to the nozzles at a sufficiently high pressure. It should be at least 40 lb. per sq.in. It is better to have it at 70 lb. per sq.in. There should be a pressure gage on the water main near the washer. Usually sufficient pressure cannot be maintained without a booster pump at the washer. A centrifugal pump driven by a 3 to 5 hp. motor will do the trick.

Sorting belts should never run at greater speed than 25 ft. to the minute. Better to have it at 20 ft. Don't guess—time it. Twenty inches is the ideal sorting belt width. There is an honest difference of opinion as to the best mechanical arrangement for inspecting and sorting tomatoes. The straight-away belt, where only unsound fruit is removed and where the tomatoes pass under the observation of numerous inspectors and are therefore, reinspected several times, has many endorsers. This is also true of the belt systems where all fruit has to be lifted and either placed on a belt which carries only sound fruit into the line, or must be lifted off into pans, bins, or onto a third conveyor carrying unsound fruit to the trimmers. Most straight-away belts are subject to the criticism that the fruit may not be turned over and, therefore, only about 25 per cent of the surface area is exposed to the vision of the inspectors. The roller conveyors which turn the fruit over and over are free from this criticism. However, such conveyors should be operated at a speed which will not convey the fruit much faster than 20 ft. per min. In general, preference seems to be for a system which requires the lifting of all fruit. It should be pointed out, however, that this system is objectionable unless an inspection of the entire surface of the fruit is made at the time it is lifted.

Regardless of the system used on straight line belts, the more experienced and efficient inspectors should be used at the back end and the less experienced ones at the front end. The sorters and the trimmers should be under the direct supervision of an active, alert, and competent supervisor whose duties are to properly school the sorters and trimmers and to check constantly the effectiveness of their work.

The amount of light on the sorting belt should be measured with a light meter. The company which supplies you with light and power will do this for you. The minimum illumination should be 35 foot-candles; 75 is not too much. The light should be directed upon the sorting belt and not permitted to shine into the eyes of the operators. Trimming belts and tables should be similarly lighted.

Important Points

Never allow sorters to trim, or trimmers to sort. Both need the best supervision that can be given them.

Do not run a mixture of good and bad tomatoes. If poor stocks are to be run, make a separate run of them, so as to be assured they will receive all needed care.

Code all runs. Be sure that lots made from exceptionally good, average, poor, and bad stock are distinctly coded. In event of trouble, this precaution may save many times its cost.

Finally, don't get scared to death of the corn ear worm, but study carefully what you can do to combat it.

Display carton and retail-store posters used to capitalize upon the inherent sales appeal of the self-peeling frankfurters.

New invention in packaging boosts sales and cuts production costs

By F. K. LAWLER
Assistant Editor,
FOOD INDUSTRIES, *New York, N. Y.*

SELF-PEELING Frankfurters

WHEN a food wrapper is developed which removes itself while the product is being cooked, that's news. And when this wrapper has a double-barreled sales appeal while at the same time reducing production costs, that's smart management.

This amazing creation was born in Boston, in the plant of Colonial Provision Co. It is a patented self-peeling frankfurter in a printed transparent cellulose jacket. It looks like an ordinary well bred hot dog, but isn't. It is, however, prepared, stuffed, cooked and smoked according to a standard packing house practice. But something different is done to it before it is packaged in cartons.

The popular practice among sausage manufacturers is to remove the transparent cellulose jacket after all processing is completed and before putting the frankfurters in cartons. This produces the skinless frankfurter so much in demand by consumers. To remove these jackets, or casings, requires labor. And while one frankfurter can be peeled in a couple of seconds, many man-hours, or rather girl-hours, are spent daily on this job in any fair-sized sausage factory. So the advantage to the packer of selling frankfurters with their "shirts" on is obvious. And that is what Colonial Provision does with the self-peeling product.

But to convert a frankfurter into the type that will shed its skin, an operation has to be performed on it. The casing must be perforated. Then, as the frankfurter is boiled by the consumer, the meat expands, the casing splits along the perforations, falls to the bottom of the kettle and the meat is ready to eat.

Perforating the casing is quite a simple operation and can be done in a small fraction of the time required to remove the casing entirely. Before a string of the sausages is cut apart on the packaging table, it is passed under a roller with small sharp teeth, or spines, in a single row and about an inch apart. The frankfurters can be pulled through this device as quickly and easily as pulling a length of rope through a pulley.

The principle of the perforating machine is shown schematically in the line drawing. It consists essentially of a base, a guide and the perforating roller. That a string of "franks" can be started through the machine quickly and easily, the roller is hinged to the base and may be raised to provide clearance between it and the guide. After one end of a string of sausages has been inserted under the roller, the operator gives a yank and, presto, each of the sausages has a row of holes in its skin. The franks are then cut apart and put into cartons.

The double-barreled buy-me appeal of this new product comes from its novelty and more sanitary packaging. Many customers buy these to "watch them shed their skins." Here is a food product that does mechanical tricks, something like a monkey on a string. People buy it so they can tell their friends about it, and some, no doubt, so they can see if it really works.

As for the sanitary angle, unlike the skinless frankfurter, this self-peeling "dog" reaches the consumer in a transparent cellulose container. The product literally is untouched by human hands, either in processing or in packaging.

There is an advantage to the packer in selling the product in the casing, too. Not only does the frankfurter have more eye-appeal, but the casing carries the packer's brand. Incidentally, in addition to bearing the brand, the self-peeling Colonial casings are printed with complete instructions for boiling to remove the skin.

Like all good product and package innovations, the self-peeling frankfurter lends itself to effective sales promotion. And it is getting business for Colonial Provision. The company has prepared special display posters for retail outlets.

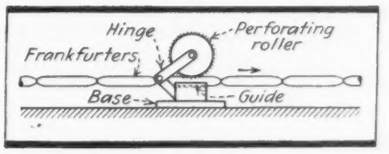


Diagram showing principle on which the perforating machine operates

ISSUES Behind the Stockton Cannery Strike

WHEN NEWSPAPER HEADLINES gave to the public the day-to-day story of the "cannery strike" in Stockton, Calif., during the latter part of April, to most readers the grim events meant merely a recurrence of the labor battles taking place the country over.

To the canning industry of California, the events in Stockton represented the first real test of an industrial relations program begun back in March and just now getting under way. The industry weathered a hard storm in Stockton, one which struck suddenly and from an unexpected quarter, and one which involved none of the usual issues of dispute between employees and employers. Stockton merely happened to be the focal point of the outbreak.

Let it be emphasized that the Stockton strike had nothing to do with the normal relationships between the canners and the workers. Less than 10 per cent of the cannery employees in Stockton belonged to any union. As one business leader put it, "This wasn't a strike. It was the attempt of a few to run the affairs of a lot of people who wanted to work."

The disturbances were not the result of any interferences with union organization. They didn't involve the right of a worker to join a union. There was no dispute over "collective bargaining," nor disagreement on wages, hours or working conditions.

The real issue, and the only issue, in the strike was the attempt of Harry Bridges, keen young leader of the International Longshoremen's Association on the Pacific Coast and No. 1 man of Pacific maritime labor, (definitely C.I.O.-minded) to extend his power in from the waterfront to include as many shore industries as possible. The Stockton fracas was only an episode in Harry Bridges' much-publicized "March Inland." Bitter enemy of Bridges, and a determined opponent of his enterprises, is the local American Federation of Labor group. The Bridges (C.I.O.) group on the one hand, and the A. F. of L. unions on the other, were responsible for the rioting at Stockton in the name of the cannery workers.

In the line of fire between these two warring forces stood the canning industry, first in Oakland and later in Stockton. Behind the line of fire was a highly organized group of farmers determined to permit no interference with the marketing of their crops. Outgrowth of recent agricultural labor disturbances, this group, known as the Associated Farmers, represented 17,000 producers whose crops have a cash value of $400,000,000. Pressure from this group on business and political leaders hastened the Stockton settlement. In passing, it might be noted that Associated Farmers of California, Inc., since its origin in the summer of 1933, has spread to 42 California counties and the movement is being duplicated in Oregon, Washington, Arizona, Texas and Minnesota.

For background it is necessary to go back to March of this year when the 61 principal canners of central California formed the California Processors & Growers, Inc. (hereinafter called the C.P.&G.). Directors included A. W. Eames, California Packing Corp.; E. E. Huddleson, Santa Cruz Fruit Packing Co.; W. A. Gellersen, Libby, McNeill & Libby; H. E. Gray, Barron Gray Packing Co.; G. F. Mason, H. J. Heinz Corp.; A. R. Plummer, Kings County Packing Co.; T. H. Richards, Bercut-Richards Packing Co.

One object of the new association was to evolve a labor policy that would carry the industry and its employees through the present era of labor unrest with as little disturbance as possible. As legal counsel the group retained Harrison S. Robinson, prominent Californian, lawyer-banker-manufacturer, of Oakland, whose practical experience in industrial relations and in business had included widely-scattered enterprises in this country and Australia.

The association formulated: (1) a long-range industrial relations policy; (2) a short-range plan for defense from attacks immediately in prospect and resulting from bitter factional disputes in California's labor ranks; and (3) a public relations policy to interpret the industry's problems to consumers and, particularly, to the farmers.

The long-range program follows the generally-accepted industrial relations technique and uses the plant

California Cannery Wage Rate Highest in U. S.

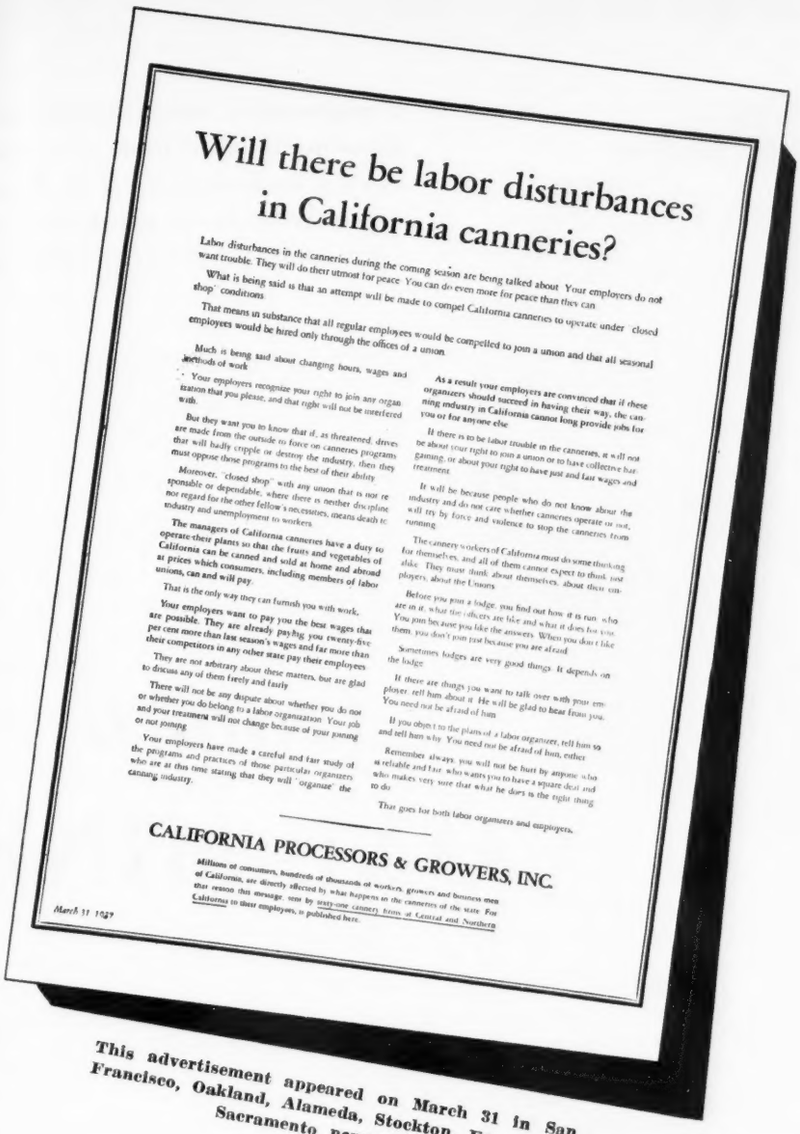
California basic wage rate for cannery workers, north of the Tehachapi, is the highest in the nation. Cannery workers in this state receive the following minimum scale: Men, 50 cents an hour; women, 40 cents an hour.

The 1937 scale in California includes a piece rate base of 42½ cents an hour. More than 80 per cent of the women employed in canneries work under this scale. The majority of men receive more than the base pay.

The range of hourly basic wage rates paid unskilled cannery workers in the various states, compiled by the California Processors and Growers, Inc., from the latest available figures for the 1936 pack, follows:

	CENTS PER HOUR	
	MEN	WOMEN
Georgia	10 –17½	10 –15
Mississippi	15	14
Kentucky (South Section)	15 –20	15 –20
North Carolina	15 –20	15 –18
Tennessee	15 –20	12½–17
Virginia	15 –20	15 –20
Missouri	15 –20	15 –20
Arkansas	15 –25	15 –20
Delaware	20 –25	17½–22½
Connecticut	25	25
Texas	25	20†
Ohio	20 –30	17½–25
Maryland	20 –27½	15 –22½
Wisconsin	20 –35	20 –30
Arizona	25 –27½	22½–25
Indiana	25 –30	20 –25
Florida	25 –35	20 –22½
Idaho	25 –35	25
New Jersey	25 –35	20 –30
Pennsylvania	25 –35	20 –25
New York	25 –40	20 –25
Utah	27½x32½	22½–27½
Illinois	27½–40	25 –30
Louisiana	30	25
Kentucky (North Section)	30	20
Iowa	30 –35	25 –30
Maine	30 –35	20 –27½
Minnesota	30 –35	25 –27½
Vermont	30 –35	30 –35
Oregon	32½	27½
Washington (East Section)	32½	27½
Colorado	32½–35	27½–30
Michigan	32½–40	20 –27½
Massachusetts	35	25
Nebraska	35	27½
Montana	35 –40	27½–30
Washington (Puget Sound)	40 –47½	27½–32½
California	**50**	**40***

† Does not include Rio Grande Valley.
* California scale for women includes piece rate base of 42½ cents an hour.



Will there be labor disturbances in California canneries?

Labor disturbances in the canneries during the coming season are being talked about. Your employers do not want trouble. They will do their utmost for peace. You can do even more for peace than they can.

What is being said is that an attempt will be made to compel California canneries to operate under "closed shop" conditions.

That means in substance that all regular employees would be compelled to join a union and that all seasonal employees would be hired only through the offices of a union.

Much is being said about changing hours, wages and methods of work.

Your employers recognize your right to join any organization that you please, and that right will not be interfered with.

But they want you to know that if, as threatened, drives are made from the outside to force on canneries programs that will badly crippe or destroy the industry, then they must oppose those programs to the best of their ability.

Moreover, "closed shop" with any union that is not responsible or dependable, where there is neither discipline nor regard for the other fellow's enterprises, means death to industry and unemployment to workers.

The managers of California canneries have a duty to operate these plants so that the fruits and vegetables of California can be canned and sold at home and abroad at prices which consumers, including members of labor unions, can and will pay.

That is the only way they can furnish you with work.

Your employers want to pay you the best wages that are possible. They are already paying you twenty-five per cent more than last season's wages and far more than their competitors in any other state pay their employees.

They are not arbitrary about these matters, but are glad to discuss any of them freely and fully.

There will not be any dispute about whether you do not or whether you do belong to a labor organization. Your job and your treatment will not change because of your joining or not joining.

Your employers have made a careful and fair study of the programs and practices of those particular organizers who are at this time stating that they will "organize" the canning industry.

As a result your employers are convinced that if these organizers should succeed in having their way, the canning industry in California cannot long provide jobs for you or for anyone else.

If there is to be labor trouble in the canneries, it will not be about your right to join a union or to have collective bargaining, or about your right to have just and fair wages and treatment.

It will be because people who do not know about the industry and do not care whether canneries operate or not, will try by force and violence to stop the canneries from running.

The cannery workers of California must do some thinking for themselves, and all of them cannot expect to think just alike. They must think about themselves, about their employers, about the Unions.

Before you join a lodge, you find out how it is run, who are in it, what the officers are like and what it does for you. You join because you like the answers. When you don't like them, you don't join just because you are afraid.

Sometimes lodges are very good things. It depends on the lodge.

If there are things you want to talk over with your employer, tell him about it. He will be glad to hear from you. You need not be afraid of him.

If you object to the plans of a labor organizer, tell him so and tell him why. You need not be afraid of him, either.

Remember always, you will not be hurt by anyone who is reliable and fair, who wants you to have a square deal and who makes very sure that what he does is the right thing to do.

That goes for both labor organizers and employers.

CALIFORNIA PROCESSORS & GROWERS, INC.

Millions of consumers, hundreds of thousands of workers, growers and business men of California, are directly affected by what happens in the canneries of the state. For that reason this message, sent by sixty-one canners, from 26 Central and Northern California to their employees, is published here.

March 31 1937

This advertisement appeared on March 31 in San Francisco, Oakland, Alameda, Stockton, Fresno and Sacramento newspapers.

foremen as the principal channel for management's relationship with the employee. Training of foremen in how to deal with grievances that arise in the day's work is an important feature of the plan.

For the labor problems immediately facing the industry, the association decided: (1) to recognize and deal with any committee or organization actually selected by the employees to represent them; (2) in event of a crisis, to hire no spies or private police; (3) to make no attempt to preserve public peace, a function of the regularly-constituted authorities (this to avoid charges of coercion and intimidation); (4) to give public officials a true picture of any critical situation, explain the minimum of police protection needed to operate and at what point; and (5) lacking adequate protection, the canneries must close down.

One of the first moves of the C.P.&G. was to raise wages 25 per cent above the previous season, to the highest rate in the nation for the type of work. That brought the base pay to 50 cents an hour for men, 40 cents for women. The scale for women includes a piece-rate base of 42½ cents an hour and more than 80 per cent of the women employed in the canneries work under this scale. The public and the farmers were informed of this raise by means of newspaper advertising and publicity.

Soon after this vigorous start, the industry became involved, as a bystander, in the scrap between Bridges with his I.L.A. warehousemen's union and the old-line A. F. of L. warehouse group. After a few spectacular skirmishes in Oakland, during which the plants of the California Packing Corporation, Heinz, and California Conserving Co. were picketed by longshoremen, Bridges moved the battle front to Stockton.

Here's what happened in Stockton:

The newly-organized Agricultural Workers' Union, sponsored on a state-wide basis by the Bridges faction, opened negotiations, April 13, with the Richmond-Chase Co., Stockton Food Products, Mor-Pac Preserving Co. and Packwell Corp, regarding hours, wages and working conditions although less than 10 per cent of the canneries' employees were members of the organization. The next day, union leaders broke off negotiations and threw picket lines around the four plants. Only about 5 per cent of the picketers were members of the Agricultural Workers' Union. The rest (about 300) were longshoremen (Stockton is an inland port) who violated their agreement with employers and quit their jobs to take part in the battle.

Meanwhile, the irate farmers had served notice on all parties that they intended to deliver produce to the canneries and would shoot if trucks were attacked. In the first encounter, pickets attacked a truck delivering spinach to a cannery. They were driven back by sheriff's deputies with tear gas bombs. Then reinforcements of pickets arrived with baseball bats, brickbats and rocks. When they started an assault, the regular deputies of the sheriff and his special deputies, opened fire with shotguns, shooting low. The pickets broke and ran and the riot was quickly at an end.

The ruckus then shifted to downtown Stockton and to the Governor's office in Sacramento where the contest between the two union factions continued.

Organizer of the strike was a Bridges man, Vance Ambrose, a communist sympathizer. Back of Ambrose was Walter Mahaffey, president of the San Joaquin County Labor Council, vice-president of and an organizer for the I.L.A.

The actual cannery workers attempted to work with the A. F. of L. by organizing a new union in neighboring Stanislaus County, but the State Federation of Labor felt it couldn't stand for that, since it would result in the union being organized in one county and conducting its operations in another.

Through all the turmoil, the C.P.&G. closely followed its "emergency labor policy." Canneries closed down, took no part in the disturbance and depended on the sheriff to maintain order.

Finally, pressure from the farmers and the business leaders of Stock-

(*Turn to page* 349)

Temperature, humidity and air movement conditions in a converted coal-mine drift in Pennsylvania make an ideal location for curing blue-vein cheeses

By L. A. ROGERS
Bureau of Dairy Industry
U.S. Department of Agriculture
Washington, D. C.

...*from a* COAL MINE

At Blairsville, Pa., Blairsville Sanitary Dairy is using an abandoned drift of a coal mine in what promises to be a successful production of *Penicillium roqueforti* cheese on a strictly commercial scale in this country. Mr. Clark, one of the proprietors of this company, was at one time connected with the Grove City Creamery where he had an opportunity to observe the making of this type of cheese from cows' milk by the Bureau of Dairy Industry. Later, when he established his own dairy in Blairsville, he began to investigate the mines which honeycomb the hills around that town to determine if any of them were suitable for curing rooms.

After months of exploration and temperature recording one was found which seemed to meet all of the requirements. The mine was still active, with electricity and forced ventilation available. In this mine the ventilating air is forced through an abandoned drift at a lower level which has nearly filled with water. While flowing over this underground lake the air becomes saturated with moisture and tempered so that it stays at 46 to 48 deg. F. throughout the year, an atmospheric condition highly suited to the curing of blue-vein cheese.

With the active cooperation of the mine superintendent, a section of one of the abandoned drifts was cleared of debris and bulkheads were installed with dampers to control the flow of air. This flow had to be reduced to a small fraction of its normal rate to prevent drying of the surface of the cheese. At this reduced rate, the movement of air is sufficient to hold an approximate temperature of 48 deg. F. within reasonable limits of variation; the relative humidity is always near the saturation point. To assure sanitary surroundings and means of stacking the cheese, the walls of the drift were white-washed and mine props were installed to support rows of racks.

The cheese is made and drained in the dairy plant in town and taken to the mine. The salting is done in an ante-room of the curing room. A refrigerator is available at the plant for storage after the ripening is complete, but a considerable part of the cheese is wrapped and held in the mine until sold.

Although the business is still a modest one, the sales are gratifying and show a slow but healthy increase. Recently the sales demand has caught up with production. Cheeses which become too sharp for the usual trade are readily disposed of among the Italian miners who prefer their cheese with plenty of flavor.

No doubt many people who have a cave or an abandoned mine in their neighborhood will be inspired by the example of the Blairsville Sanitary Dairy. But it is not enough to have a cave. There must be moisture on the walls and sufficient circulation of air to lower the temperature 2 or 3 deg. below that of the earth and to keep the relative humidity near the saturation point. Moreover, there must be a milk supply available at cheese prices and enough working capital to hold the cheese through the five to eight months' ripening period.

An obvious reason for the interest in the domestic manufacture of the blue-vein or roquefort type cheeses is the high price paid by dealers and consumers for the imported varieties of blue-vein cheese. The best known of these cheeses are the French Roquefort made from sheep's milk, the Italian Gorgonzola made from cows' milk, and the English Stilton also made from cows' milk.

Manufacture of the French cheese is confined to the district around Roquefort, where a breed of sheep with a relatively high milk production

has been developed. The cheese is cured in the caves cut into the limestone hills rising behind the town. The crevices and caverns in these hills have openings at different levels and the evaporation from the damp walls lowers the temperature until there is a decided downward flow of cold, damp air. Artificial caves cut horizontally into the hills intersect these passages and through the control of the flow of air by dampers the required temperature and humidity are obtained.

Gorgonzola was originally ripened in caves, but at the present time much of it is cured in artificially cooled rooms. One of the older plants uses curing rooms built above ground, but cooled by air flowing from caves similar to those at Roquefort.

The actual making of cheese of the blue-vein type is not especially difficult. As long as fifteen years ago, the Department of Agriculture published complete and detailed directions for the manufacture of a *Penicillium roqueforti* cheese from cows' milk. The high salt content and low temperature of ripening eliminate many of the bacteriological troubles which frequently lower the value of other types of cheese. The yield of cheese is large, and when the quality is good the price is relatively high. In spite of these advantages, the early attempts to make these cheeses commercially were failures due to certain unfavorable economic conditions and to an under-estimation of the importance of curing room conditions.

The reputation of the French Roquefort was so firmly established that the majority of people who ate this cheese could not be convinced that a satisfactory blue-vein cheese could be made in this country. Also the retail price has been maintained at such a high level that the market is very limited. At the present time the French Roquefort is not an important factor in the attempt to establish a domestic blue-vein cheese industry. It is the Danish blue cheese, now sold widely at a price much lower than that of the French Roquefort, which has established a competition that is difficult to overcome. Present price levels of the Danish cheese necessitate that domestic factories keep their production costs to such a level that they can sell their blue-vein cheese output at from 26 to 30 cents per pound and still have a healthy profit margin.

The curing room conditions for this type of cheese are very exacting and its manufacture should not be attempted unless they can be met in every detail. The temperature should not greatly exceed 48 deg. F.; slightly higher temperatures for a short period are not necessarily fatal. Lower temperatures are admissible but, while the cheese will ripen satisfactorily at as low as 42 deg. F., the time required for curing will be increased.

It is essential that the air of the curing room be nearly saturated with water. Any deviation from this near-saturated condition will result in drying and discoloring of the cheese and in inhibition of the mold growth. Since a current of air, even though the air is very moist, will dry the surface of the cheese, movement of air must be restricted to a very gentle current.

All of these conditions can be produced artificially, although a high humidity is difficult to maintain without considerable movement of air. Furthermore sprays have to be adjusted with care to avoid wetting the shelves on which the cheese is stacked. These requirements can be met satisfactorily by preconditioning the air in a bunker and drawing it into the curing room as needed.

The advantages of rooms naturally provided with the proper temperature and humidity throughout the year are obvious; in many cases the elimination of the cost of refrigeration may be essential to success.

No doubt, many natural or artificial caves exist in different parts of the country which meet the requirements of a blue-vein cheese curing room. A farmer in Oregon has been making an excellent quality cheese from goats' milk for several years. At first he cured his cheese in an artificial cave. Later he built a room in an immense spring of icy water, so that the water flowed over the flat roof and down the sides, turning in its fall a wheel which circulated the air in the curing room.

THE COLLEGE OF AGRICULTURE of the University of Minnesota has demonstrated that the caves cut into the sandstone cliffs along the Mississippi River, and used originally to store beer, may be made into blue-vein cheese curing rooms.

We have investigated a situation on the Columbia River where these conditions are combined to an exceptional degree. Sufficiently isolated to be free from city milk competition, a small valley is producing an abundant supply of milk of good quality which can be bought at Cheddar cheese prices. At the opening of the valley is a cave, a huge bubble in an ancient lava field. It has a level floor 20 ft. wide, a domed ceiling 30 to 40 ft. high, and is a half mile long. The temperature, which has been under observation for over a year, has not varied more than a degree from 42 deg. F. and the air, which has an almost imperceptible motion, is nearly saturated. With this very gentle movement of air the exceptionally low temperature of this cave can hardly be accounted for by evaporation. Possibly there are subterranean streams of ice water from the snow fields above the valley. In this case, the factor lacking for the development of a blue-vein cheese manufacture is capital.

Has excellent texture and flavor; excels that of most blue-vein cheeses.

FLAVOR IN FOODS

A symposium on flavor at the spring meeting of American Chemical Society, Chapel Hill, N.C., April 14, 1937

NO ONE CAN DISPUTE THE FACT that flavor is perhaps the most important factor in all foods. Yet, as we become more conversant with the difficulties surrounding the scientific interpretation of flavor, we realize that (even more than in our eyesight) there is a variation in the acuteness and quantity of flavor-sense for each individual. It thus becomes apparent that there is a great need for immediate and consistent development work to provide definite scientific flavor data.

The symposium on flavor held at Chapel Hill, N. C., was undoubtedly most helpful, for it not only presented the available advanced scientific information, but dealt with specific methods for testing of consumer acceptance and for developing desired flavors.

How to Measure Odor and Flavor

The first paper, by Ernest C. Crocker of A. D. Little, Inc., defined flavor as a combination of taste and smell into which various physical conditions of the food substance also enter. Coolness, pungency, smoothness and oiliness make the feeling of foods in the mouth really a part of the flavor. The psychological effects of color, as in certain jams, and similar foods, tend to accentuate our consciousness of a flavor. Even the sound effects, produced during the eating of certain foods, influence that general effect which we call flavor.

Just what gives rise to taste is not definitely established, but it is attributed by some to the Dyson effect presumably caused by the vibration of the atoms in the molecules as they come in contact with the nerve ends.

Smell is dependent upon four nerves and odors are capable of fairly careful analysis if conditions are properly arranged. The best method of determining smell is to provide a glass tube which will fit the nostril and to use the nostrils alternately in testing by holding the glass tube down close to the surface of the solution in an Erlenmeyer or similar flask.

Odors are generally divided into eight degrees of strength. These are usually determined by the use of an osmoscope which is arranged to permit diluting of the odor with air until it can no longer be perceived. The results are referred to a logarithmic type of scale. Vibrations of varying intensities have been found to give characteristic odors.

▶Food manufacture of the future will place a greater value on flavor than on nutritive properties as the soundest possible sales appeal. Good flavors are the more difficult to attain. This review of the symposium on flavor is therefore of interest to

All Food Manufacturers

Practical tests for flavor are divided into four definite senses: sweet, sour, salt and bitter; sweet being the least effective and bitter the most effective. Careful measurements show that 0.68 per cent of sucrose is perceptible, 0.019 per cent acetic acid, 0.18 per cent salt and 0.009 per cent quinine when about four cubic centimeters in water solution are tasted. Mr. Crocker states that anhydrous dextrose is 60 per cent as sweet as sucrose.

Laboratory tests indicate an ability for the same individual to check within about 10 per cent. The more sensitive taster will notice differences of 6 per cent, differences of bitterness being the most difficult to check. Mixtures possess the property of accentuating flavors and require repeated testing for each different ingredient. Astringency, such as in tea, and certain other physical effects, add difficulty in establishing primary taste quality.

Professional tasters are not persons of abnormal taste sense but by long and careful training they have been able to develop their ability to distinguish one taste from another with great accuracy and to determine through dilution, the continued persistence of a specific taste. Certain effects, such as *apparent* acidity, may not mean chemical acidity but may be a combination of tastes.

What is called "body" is a combination of tastes which produce certain flavors and might be described as a general flavor impression. In practice, blends are more satisfying than a single original taste.

Our oldest recognized flavoring substances were various spices and their testing has been elaborately conducted for a long time. Odor being a very important part of the effectiveness of these substances, it is necessary to evaporate solutions of the spices upon blotters and determine the odor and then determine the amount of taste by dilution of solutions of the spices.

A very large proportion of the general public is very sensitive to flavor but they are influenced by the physical characteristics of the food as well as the color and general appearance. In establishing preferences for foods it is necessary to arrange samples and conditions very carefully to attain accuracy. It is not possible to duplicate taste tests many times because the senses become rather rapidly dulled and wrong impressions would be obtained if one attempted too many times to taste and retaste the samples. Accurate results are best obtained from groups which have been educated to develop their taste consciousness.

How to Get Good Judges of Flavor

Florence B. King, of the Bureau of Home Economics, U.S.D.A., has obtained some valuable information on flavor in bread. She finds that we are most sensitive to flavor when the foods tested are at temperatures between 20 deg. C. and 30 deg. C., that the sensitiveness rapidly decreases between 30 deg. C. and 50 deg. C. and that the general public notices the presence of a flavor but rarely analyzes it to determine what are its constituents. Through careful elimination, she has selected a testing

group of fourteen members from an original group of 64, covering various ages and sex, smokers and non-smokers. These judges were tested on odors and taste of solutions and those who were less sensitive were eliminated. Fourteen were chosen from the best 25 by further tests in duplicate on bread samples. She found that taste sensitivity for smokers, females and persons under 30 years of age were significantly lower.

The taste accuracy for the following substances in molar solutions are indicated in the following table:

How Little Can You Taste?

These solutions contain an equal number of molecules of the substances to be tasted

	Most Sensitive Persons	Medium Sensitive Persons	Least Sensitive Persons
Sodium Chloride	.0008	.0128-.0256	.2048
Sucrose	.0004	.0128	.1024
Lactic Acid.....	.0002	.0016	.0128
Caffeine	.0002	.0032	.0128

She found no direct relation between the taste sensitivity to solutions of substances and the ability of the group to accurately taste flavors in bread. No distinction was found between bread made by the sponge process and by the straight dough process, nor could they distinguish any flavor difference in bread between 12 and 24 hours old, yet the absence of salt was always sensed by all persons.

How to Interpret Judgments of Flavor

The discussion by Washington Platt of The Borden Company was of particular value to those who are interested in determining the preference of the public for foods which are produced in different ways or with different flavor effects. If they wish to find out which of several samples is desired, and are not interested in the reasons why, he indicated which factors are of importance and which ones are not to be taken too seriously.

The choice of judges in these discrimination tests is very important. Care must be taken to see that they are representative of the group that will be expected to purchase the materials when produced, because a very large error may be introduced if the national preferences and the social standing of the group are not taken into consideration. All tests should be made under normal conditions for the eating of such a food substance, and incongrous foods should not be offered at times when such foods would have either insufficient or too great appeal to the taste of the judges.

First impressions are more valuable than repeated tastes and generally the judging should be limited to two samples at a time. If the judge tastes and retastes, it is quite likely that the stronger taste will be chosen because his sense of taste has become deadened by repeated tasting. For this reason, the size of the samples offered is important. Also, a taste judgment may not indicate what the judge would like for a steady diet because a preference might be expressed for one substance as against another, whereas neither one might be particularly pleasing nor would it be purchased for its flavor.

Every person asked to judge, will express a choice even though they have no real choice between the two and a retest at a later date may reverse the first judgment. Therefore it is best to retest the same group to determine the number of these guesses and, since the law of probability will indicate that one-half the guesses will be reversed, the number of such guesses should be multiplied by two. The final result will show three things: 1. Favorable; 2. Unfavorable; and 3. The number of those who have no real preference. This knowledge will make possible the reconstruction of the original figures and a much greater final value obtained from the test. The final figures will show the number who would buy, the number who might buy and those who would not buy. (See Platt's article in Jan., 1937, FOOD INDUSTRIES, page 7.)

Flavors in Meat Products

Paul E. Howe of the U.S. Bureau of Animal Industry, stressed the importance of the physical characteristics of foods as largely influencing the flavor sense. Meat flavors change after heating to 100 deg. C. and most of the flavor of a thick steak is on the outside. Gravy must be heated to give it the characteristic flavor, and salt intensifies rather than increases the flavor. There is great difficulty on the part of many to distinguish between the flavors of different meats, but the odor of the cooked fat and the appearance of the meat and fat make them generally distinguishable by most persons.

Ripening of meats changes the solubility of the proteins and causes changes in the flavor of meats when cooked. Hams are most susceptible to taste variation because the taste depends upon the many factors entering into the curing of the hams. This dependence is particularly true of the age of the ham. Much work has been done on the production of certain flavors and the University of Maryland has developed fully cured hams with a fine flavor, in six to eight weeks. The change in hams is largely due to the increase in fatty acids, and changes in the proteins. Dr. Howe stated that the flavor of monosodium glutamate disappears after successive recrystallization, indicating that the presence of quantities of certain substances, too small to be determined chemically, presumably had large influence on flavors of meats.

Flavor of Alcoholic Beverages

E. K. Nelson of the Food Research Division, Bureau of Chemistry and Soils, U.S. Dept. of Agriculture, spoke on the flavor of wine under four headings:

1. Flavor naturally occurring in the grapes; 2. Flavor due to the variety of yeast; 3. Flavors introduced by aging in wood; 4. Flavors developed by length of aging.

The volatile flavor varies largely in different varieties of grapes and approximately as much flavor remains in the pomace as that contained in the juice which would indicate that the flavor is not at all contained in the skins, as some have supposed. Different kinds of yeasts produce various amounts of acid and higher alcohols, and the final flavor is largely dependent upon the nitrogenous food available to the yeast. The bouquet produced in a wine is largely influenced by the character of the yeast, that factor being even more important than the quality of the grapes. The bouquet and the volatile esters increase in about like ratio, although the presence of a particular ester is important in distinguishing certain grades of wine. About the effect of enzymes we know comparatively little but, from our general knowledge, it is certainly likely that they contribute very largely in the final bouquet of the wine.

Butter Flavors

L. M. Thurston, Professor of Dairy Technology, The University of Florida, discussed butter flavor which may be due to many factors. The flavor in butter, because of its low temperature of storage, is probably chemical and it is presumed that oxi-

(*Turn to page* 346)

SAVING *through* SAFETY

Cost, causes and cures of plant accidents, as analyzed for the brewing industry

By JOHN M. ROCHE

Engineer,
Travelers Insurance Co.,
New York, N. Y.

AN ACCIDENT costs the manufacturer four times as much as the insurance company pays. This is a significant point revealed by an analysis of several thousand accidents by a large insurance company. The reason lies in hidden costs which come from damaged plants and equipment, damaged products, interruption of production, cost of investigation by foremen and safety men, loss of time for visiting the first aid room, the expense of breaking in a new man to do the work and the loss in efficiency of the injured employee.

Unsafe working practices cause most of the major injuries to brewery workers, it has been shown by a study of brewery accidents in New York State since 1933. These practices cause the accidents usually analyzed as due to carelessness, haste or just plain dumbness. If John Jones, working at the racking machine, hits his thumb instead of the bung, we'd say he was careless. But, if we investigate, we might find that he was talking to another worker or that he has a habit of stepping on the tripper too quickly.

You might well ask, "How can we discover these things? How can we correct them if we do find them?"

THE FIRST and most important requirement is executive interest and participation in the safety program. The second is making all foremen and department heads understand that they are responsible definitely for accidents in their department, no matter what the cause. The third is requiring foremen to make it part of their routine duty to detect and correct unsafe working practices of their men. Fourth and last, after determining that an unsafe working practice exists, take the necessary corrective action.

The functioning of a safety program is improved if a safety committee is appointed. These committees usually consist of an executive, several foremen, the safety director and sometimes the insurance company's safety engineer. They keep in touch with conditions in the plant, analyze accidents to determine the unsafe practice or condition involved, and pass on recommendations made by foremen or safety men.

Assuming that there is executive cooperation, the question of whether or not it is fair to charge the foreman with the responsibility for accidents is brought up. These men are the liason group between executives and workers. They are chosen because of their knowledge of the work and for their ability to lead other men. If they are given the privilege of issuing orders, they must accept the responsibility for having them carried out. If a foreman fails to meet production requirements, he, as head of that department, is alone responsible. If he allows accidents to occur that damage equipment or cause serious and costly injuries to men, it is likewise true that he is responsible.

Forty-five out of every 100 injuries in the brewery occur when the employees are handling materials. Hand and foot injuries are the direct result of accidents in these activities. Consequently, leather hand pads or gloves should be provided where practicable, as these will prevent many of the bruises, splinter wounds and cuts. To decrease foot injuries, safety shoes or boots ought to be worn by workers handling heavy objects. Steel toe caps will withstand a severe blow while the non-slip soles on this type of shoe will eliminate many slips and falls. To protect delivery men who must handle heavy barrels on stairs, rope hooks should be provided.

A first line of attack in any campaign to reduce brewery accidents involves mechanical safeguards. Machines, whether maintenance or production, should be equipped with the best guards the market offers. If no guards are available, then they should be designed and applied by brewery engineering departments. Belts, pulleys, gears, chains, sprockets, fly wheels and other dangerous moving parts may be found in nearly all operating departments of the modern brewery. Wherever they are located, they should be competely enclosed with guards. In the mechanical departments, saws, jointers, shapers, stave machines and punches should be provided with point of operation guards that will prevent the hands of the operators from entering the danger zone while the machines are running.

HOISTWAYS and elevators, often the scene of serious injuries, can stand plenty of improvement in most breweries. Some of these antiquated devices have long outlived any possibility of efficient operation and should be replaced with modern equipment. Where they can be made safe, action should be taken immediately to eliminate the hazards.

Floors, stairs and platforms in breweries take severe punishment because of the nature of the work, and often they are allowed to wear to the danger point. One of the best types of floors, both from a service and safety standpoint, is a concrete floor with carborundum particles worked into the surface. This type of floor will prevent most slips and falls even when wet.

The market now offers composition tile with a non-slip surface that may also be used for safe flooring. Safety treads for stairways, either metal or

(*Turn to page* 344)

▶ ***Accident prevention is a prime necessity in every manufacturing plant. Neglect can be so costly that adequate safety measures should be routine with***

All Food Manufacturers

From a paper prepared for National Safety Council.

Fig. 1—One thousand tons of flour stored on platforms in one section of warehouse of Fisher Flouring Mills. Small platforms and straight piles permit compact storage. Aisle on left provides accessibility.

Putting EFFICIENCY *Into* WAREHOUSING

New methods enable 3,000 lb. of flour to be handled as a unit, saving labor, improving control and making inventory easier

By DON R. LEAS
Seattle, Wash.

▶ ***Greater efficiency in handling materials is a means by which many manufacturers and distributors can curtail costs. Ways of attaining better efficiency in handling are discussed on these pages. The methods involved will be understood by***

All Food Manufacturers and Distributors

INTRODUCTION OF NEW METHODS and effective use of standard equipment for handling materials have yielded high returns in the warehouse of Fisher Flouring Mills, Seattle. This company, which operates the largest flour mill west of the Mississippi, has enabled four men to do the work of seven in receiving and shipping operations. At the same time it has saved warehouse space (Fig. 1), improved control over warehousing and shipping operations, simplified inventories and reduced errors in filling orders.

All this has been accomplished primarily by efficient use of power operated lift trucks which handle 3,000 lb. of flour at one time. But the trucks alone do not account for the success of the system. Special provisions have been made for getting the flour onto the trucks and for loading it onto cars, trucks and boats after it leaves the warehouse. A system of coordinating warehousing with manufacturing and shipping also plays an important part.

The simplest way to present a clear picture of the methods and equipment used is to discuss in order the three phases of handling in the warehouse—receiving, storing and shipping. There are two key units in the receiving operation. One is a revolving table which serves a central receiving station for bags coming from the mill on a belt conveyor (Fig. 2). The other is a group of twelve bins surrounding the table, the bags of flour being removed from the table and stacked in these bins to be picked up by trucks and conveyed to storage (Fig. 2 and Fig. 3).

The revolving table is built of wood and has a metal deflector in the center which keeps the bags near the outer edge. It is 15-ft. in diameter and is rotated by a 1½ hp. motor operating through reduction gears.

Around the table and about 3 ft. below it is a run-way, or platform, on which the table men stand. Bordering this runway are the twelve bins, or piling forms. These bins are open in front, and at the back is a door which raises to permit the trucks to pick up the stack of bags. In the bottom of each bin is a set of built-in rests on which the stacking platforms are placed, these rests being about 2 ft. below the level of the run-way. With this arrangement the top of an 8-ft. stack is within easy reach of the table man and only 3 ft. above the point from which the sacks are lifted.

Before the handling operations are started, the table men learn from a packing sequence the brands and sizes of the products to be run. Then they select a bin for each brand and size. As a bag comes down the belt-conveyor chute onto the revolving table and is carried in front of the proper bin, a table man with one downward sweep throws the bag onto the bin platform.

There is a standard procedure of

Fig. 2—Two men sort and stack on platforms 20 tons of flour an hour with the aid of revolving table and piling bins. This is central receiving point for bags of flour coming to warehouse from mill. Note hinged section of chute at right. Supported by counterweight, this section is raised by sacks passing under it if table piles up when operator is away.

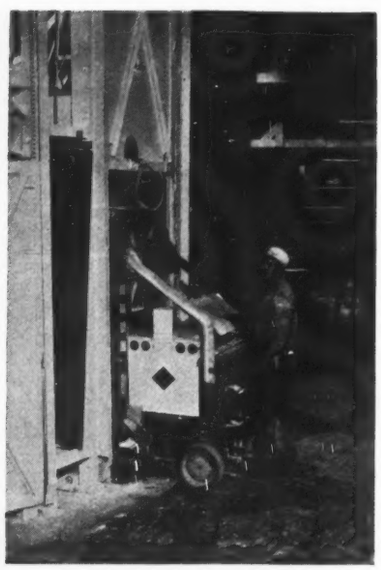


Fig. 3—Electric lift truck picking up platform with 3,000 lb. load of flour. Door at rear of piling bin is raised to give access to load.

piling for each size sack, and the table men refer to this for proper placing of the sacks in each layer. The height of the loads must be kept to a certain level, because each of the lift trucks is equipped with a "stabilizer" which must go over the top of the load.

When the required load height is reached in a bin, a table man releases a catch, and, by means of a counterweight, the door at the back of the bin is raised. This action signals the electric truck operator, who runs his truck up to the bin and takes the pile of sacks away to the storage area. After removing the load, the truck man obtains another platform from a reserve pile, places it on the bin rests and pulls down the door. The bin is then ready to receive the next stack.

Two men at the rotating table are able to sort and load on platforms 20 tons an hour. One reason for this high rate is that no time is wasted in building the loads straight. The bins make first-class piling forms. One truck operator hauls the 20 tons an average distance of 300 ft. on each of two floors, with a maximum haul of 600 ft. And he can actually handle 25 tons an hour.

The truck used in this operation is a standard industrial electric lift truck, except for two variations (Fig. 4). It has six wheels and is equipped with the stabilizer. The usual four-wheel truck was not satisfactory because of the excessive concentrated load on the small area of the four wheels. So an extra set of wheels was added by the factory to provide better load distribution. And because a load approximates 8 ft. in height, it is necessary to steady it for movement over ramps and uneven floors. To accomplish this the truck was equipped with a "top" which works in conjunction with the lift platform to effect a squeezing action on the load as it is lifted. As a protection for the operator, the truck also has a rear bumper.

The platforms used with the trucks are not the usual type. They have no legs. There are approximately 10,000 platforms in use, and storage space for the "empties" is an important item. Since the rests are not attached, 40 platforms can be picked up by a truck. And being only 3x4 ft., the platforms require little storage space. Made of 2x4's bolted together, the platforms are light in weight and easily handled.

THE PLATFORMS with their load of flour are placed by the truck on wooden rests laid parallel on the floor of the storage area. But this placement in storage is not done at random. For each warehouse floor there is a planning chart, and this plays an important role, not only in storing but in shipping. The company also has a planning department which coordinates manufacturing operations and storage in the warehouse in such a way that the amount of stock will conform to the warehouse space available and to the standard inventory which has been set up for the respective brand and size.

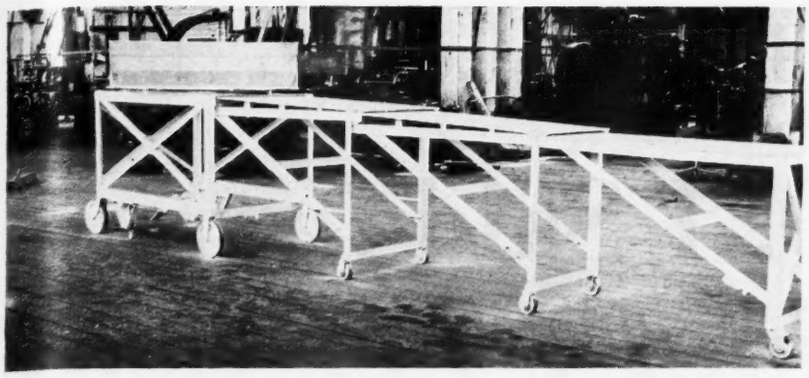


Fig. 5—Telescoping table for loading cars. Bags slide down chute and along table to end of car.

As each load is placed into or removed from storage by the truck operator—on orders from the planning department—the move is recorded by the truck driver on a special form attached to the clipboard of his truck. This recording is made easy because the rows of platform rests are designated by a letter and each bag by a number. The report made by the truck operator goes to the planning department, and the movement of stock is recorded on the floor charts there. This makes it possible to visualize at a glance the storage conditions in the warehouse, together with relative amount of stock on hand.

But that is not the only advantage of the system. Because storage is in large units, any necessary movement of stock in the warehouse can be accomplished cheaply and without any change in the number of workers in the warehouse. Then it is easier to take inventory as the stock can be checked quickly and more accurately due to the standard-size loads. Also, breakage has been reduced as a result of less handling of stock.

As compared with the old hand trucking system, this method of warehouse handling, with its central receiving point, or revolving table, eliminates an intricate belt system. This makes more storage space available and facilitates cleaning. Elevation of the stock on rests also aids cleaning, while at the same time reducing damage by insects and rodents.

When stock of the earliest date of manufacture must be shipped first, it is important that it be located as close as practical to the shipping terminal. Under this warehousing system, shipping by date becomes much easier, and shipments can now be planned so as to make room for receipts from the mill.

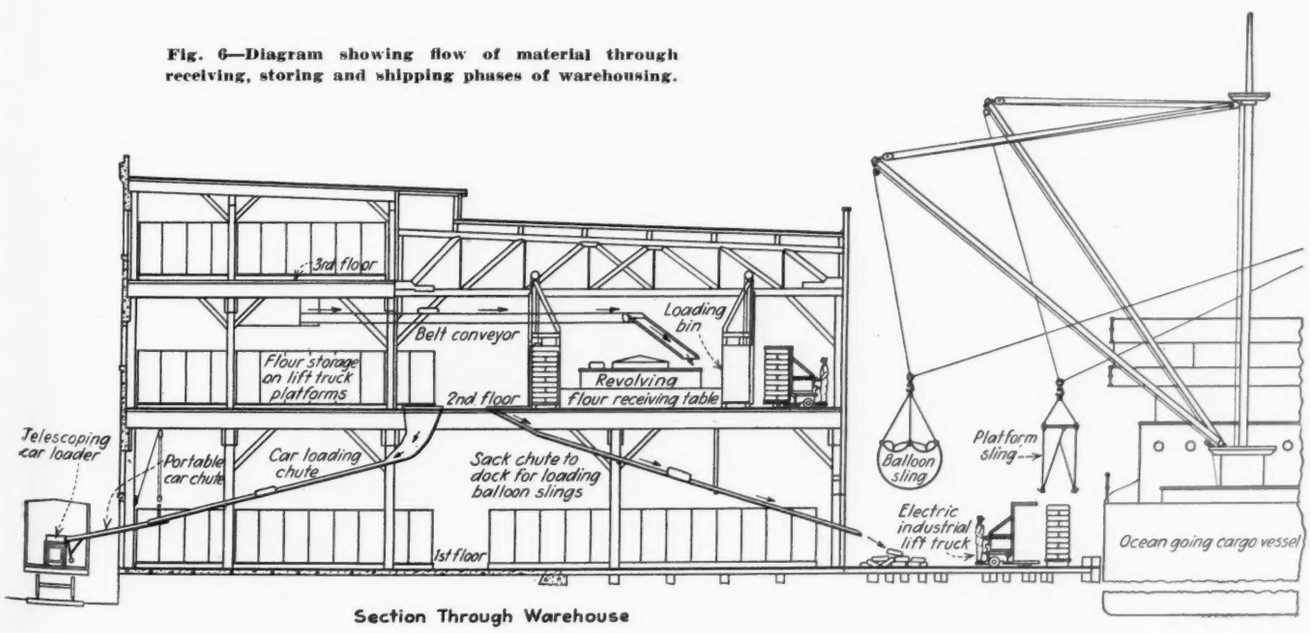
Mistakes in shipping, while not necessarily serious, always are regrettable. And with this system there have been fewer mistakes. That is because fewer men are engaged in moving the stock and because the planning charts enable back-checking to be done much more readily.

Fig. 4—Lift truck carrying 8-ft. pile of bagged flour to storage area. Stabilizer on truck fits over top of load to steady it over ramps and rough floors. At left is one of the rails on which the edges of the platforms rest when set down by truck.

New means of handling flour to improve efficiency also are utilized in

(*Turn to page* 345)

Fig. 6—Diagram showing flow of material through receiving, storing and shipping phases of warehousing.



Section Through Warehouse

Did You Say 15 Per Cent?

NO, I Said . . .
Less Than 7 Per Cent

Debunking the Past of the Supermarket

By **IVAN C. MILLER**
Editorial Staff, Food Industries

WHEN JOHN HARTFORD, president of A. & P., the world's greatest retail organization, honors competitive supermarkets with a tour of inspection, there is a reason. When his company, which has so abundantly prospered, acknowledges by adaptation the merit of a rival merchandising plan—the supermarket plan—the rival system must be recognized as an effective instrument of distribution.

But what is a supermarket? What is the supermarket plan? How big is a supermarket, how large a factor is it in retailing? How will its growth affect chains, voluntaries and independents? Will it grow? Or will it be short-lived? How will it affect the manufacturer? Most of these and similar questions are on the tongue of everyone who earns his living out of food. In a series of articles, of which this is the first, FOOD INDUSTRIES will attempt to answer these and many other questions regarding supermarkets and the supermarket method of distribution.

To determine the significance of the supermarket movement, and to measure its actual magnitude, it is necessary to review food retailing over a period of years. Those past 40 can remember the grocery store before the chain-store era, the grocery store where father stopped on his way home from work to buy food for the evening meal. That was the period of order boys and horse-and-wagon deliveries, the period of family buying and the "lagniappe"—candy and cookies for the youngsters, gratis with the big Saturday night purchase or on payment of the monthly bill. Progress and change have characterized the years since. Telephone, chain store, and automobile have revolutionized retail food buying. The sociological effect of this change, as related to supermarkets, will be discussed in a later issue.

The chain store, which has speeded up the retail tempo and vastly improved merchandising methods year after year, is not the invention of the modern age. Records disclose a chain of stores in China 200 years B.C., according to *Chain Store Manual,* which also credits "The Governor and Company of Adventurers of England, Trading Into Hudson Bay," chartered in 1670, as the oldest chain in America. No doubt A. & P. is entitled to laurels as the first food chain to be established in the United States; but not, however, the first grocery chain, which the Federal Trade Commission lists as having been initiated in 1872. The gro-

Table I—Per Cent of A & P Stores in Each Size Group for the Years 1922 and 1926*

	1922	1926
$5,000 to $9,999	0.59	.....
10,000 to 24,999	22.00	12.22
25,000 to 49,999	60.00	65.81
50,000 to 99,999	17.26	21.00
100,000 to 249,999	0.13	0.95
250,000 to 499,999	.....	0.02
	100.00	100.00
Total stores	7,350	14,811

*From Federal Trade Commission's report relative to size of stores of retail chains.

Doesn't look much like the old corner grocery.

cery chain movement had gained considerable momentum before A. & P. entered the field in 1912.

Chain-store expansion, particularly in the food field, was achieved by organization of new units rather than acquisition of existing stores. The huge A. & P. chain was built almost entirely by this method. Only during the mad epidemic of mergers, prior to the crash of 1929, did a few other food chains initiate any marked expansion through acquisition. This took the form of merging other chains rather than acquiring independent unit stores. Early chain-store expansion was characterized by a race to establish outlets rather than to expand sales of existing stores. As a result of this wholesale planting of retail stores, many unprofitable outlets were harvested and shucked out as nubbins. The remaining stand was cultivated for greater yield per store. Larger units, with less overhead per unit of sale, replaced small stores with meager or no profit.

This tendency toward store and volume enlargement is indicated in Table I, which shows the trend of A. & P. store sizes. In Table II the trend of the remainder of the group of chain stores studied by the Federal Trade Commission during its investigation of retail chains, indicates that they, too, were carried along by the economic current toward larger units. This trend is further illustrated by Table III(a) and III(b), which cover the period of recovery from the depression. During these years, most of the larger chains reduced the number of outlets by weeding out the least profitable stores. In spite of a decreasing number of outlets, these chains show an increasing volume of total sales, as well as increased sales per store. Particularly is this noticeable in the case of Safeway, whose sales per store have increased more than 54 per cent since 1933.

Table II—Number of Chain Stores With Annual Sales Above $250,000*

	Number of Chains	Number of Stores	$250,000 to $499,999	$500,000 to $999,000	Above $1,000,000
Year 1922					
Grocery stores	30	606	9	....	3
Combination stores	26	1,168	35	10	3
Meat markets	13	134	9	...	...
Totals	69	1,908	53	10	6
Year 1926					
Grocery stores	56	1,382	7	3	1
Combination stores	52	3,687	48	9	3
Meat markets	36	361	2	1	..
Totals	144	5,430	57	13	4
Year 1928					
Grocery stores	77	1,918	7	4	2
Combination stores	81	9,028	76	14	5
Meat markets	44	479	2	1	..
Totals	202	11,425	85	19	7

*From Federal Trade Commission's report relative to size of stores of retail chains.

Popular definitions of supermarkets emphasize the importance of the volume of sales, generally including stores with annual volume of sales above $300,000. If the sales volume alone is the one quality of a supermarket, Table II indicates that there were at least 69 chain stores in the supermarket class in 1922. All of them had a sales volume above a quarter of a million dollars and there were at least 111 in 1928. According to Table IV, there were 619 stores

A store that draws a crowd like this is more than a grocery store.

Not much resemblance to the little red A & P's of 1912

with sales above the quarter-million dollar mark in 1929. Pittsburgh's downtown business district, according to a Department of Commerce report, contained four combination grocery stores in 1929 with aggregate sales of $9,212,855, an average for each above $2,000,000 per year!

Although the stores represented by the figures in the first six tables were not supermarkets, and did not call themselves such, the figures do indicate a definite economic movement towards larger volume of sales per store. Most of the stores that now designate themselves as supermarkets came into existence in 1933 or later. The increase in the number of stores in each sales-volume bracket in Table V, between the years 1933 and 1935, serves as a fair criterion for measuring the strength of the supermarkets at the end of 1935.

What portion of the total retail sales volume belongs to the supermarket? As early as 1936, various estimates that appeared in print, whether based on studies, surveys, or wild guesses, credited supermarkets with amassing 15 per cent or more of total retail food sales. According to Table V, there were 489 stores in 1929 with yearly sales above $300,000, 292 in 1933, and 479 in 1935, a gain from 1933 to 1935 of 187 stores. Probably not all of these were supermarkets. But for the sake of discussion grant that all were supers.

Stores with annual sales of $300,000 per year (see Tables V and VI) averaged $585,000 per store in 1929, $524,000 in 1933, and $516,000 in 1935. Grant that the 187 additional stores in 1935 were all supermarkets, grant also that their sales were in proportion with the whole group. Then their total sales would be $96,400,000—a fraction over 1 per cent of the eight and one-third billion dollar retail food sales reported by the Census of Distribution for 1935. Furthermore, the total sales of all the retail stores, both the chains and the independents, which had sales above $300,000 per year, was less than 3 per cent of the total 1935 retail food sales.

It is improbable that supermarkets have expanded their sales from the small percentage logically accredited to them at the end of 1935 to the 15 per cent claimed for them in 1936.

No accepted definition of the supermarket has yet appeared. Recently commentators have, however, reduced the sales-volume rating of supermarkets to include stores with as little as $200,000 annual sales. Yet there were 1,524 stores in 1929 with sales in excess of $200,000, long before any store was exalted by the title of "supermarket."

Dropping the bars on "super" size would add to the number and corresponding total sales volume of these stores, if size alone qualified a store as a supermarket. Whatever the limitations, and however viewed, there was no greater number of large stores in 1935 than in 1929, even though for a long period of years the trend has been toward larger and larger units.

Qualifications used by the Department of Commerce as a basis for classifying retail stores might in a few cases classify a so-called supermarket as a general merchandising store if less than 50 per cent of sales were food sales. Supermarkets, classified by any of the current unsatisfactory definitions, may have exceeded the indicated per cent of total food sales in 1935. They may have accounted for a possible 3 to 5 per cent of sales by the end of 1936. One may be liberal and grant them 6 or 7 per cent at present; but there seems to be no justification for the claims of 15 to 20 per cent of the market.

The importance of the supermarket will not be revealed in last year's figures, nor in those of this year, but will be very apparent in records of the years ahead.

Let there be no misunderstanding. This study does not attempt to underestimate or understate the supermarket movement as an economic trend in distribution, responsible for introducing new and powerful merchandising forces which will have a vital determining effect in charting the destinies of retailers, wholesalers and manufacturers alike. FOOD INDUSTRIES has no interest beyond presenting facts and logical conclusions to guide manufacturers and distributors in preparing sales plans and solving merchandising problems.

This is the first of a series of three articles on the evolution of the supermarket.

Table III(a)—Number of Retail Stores of Selected Chains, 1933-1936

	1933	1934	1935	1936
A & P	15,427	15,131	15,035	.....
Kroger	4,573	4,356	4,286	4,239
Safeway	3,293	3,201	3,408	3,347
American	2,882	2,859	2,826	2,816
First National	2,653	2,623	2,556	.....
National Tea	1,299	1,245	1,224	1,221
Daniel Reeves	685	637	615	600
Dominion	513	495	489	492
Southern	383	372	...	374
D. Pender	390	395	397	*393
Shaffer	68	68	68	67
Bohack	733	692	673	*583

*Standard Statistics

Table III(b)—Average Sales per Store 1933-1936

	1933	1934	1935	1936
A & P	$53,129	$54,200	$55,648	.....
Kroger	44,980	50,775	53,642	$57,173
Safeway	66,695	75,550	86,222	102,723
American	37,955	40,002	41,000	*40,265
First National	39,884	42,441	46,782	.....
National Tea	50,018	50,433	51,523	51,176
Daniel Reeves	34,961	38,717	36,042	38,514
Dominion	38,515	38,051	36,555	39,502
Southern	34,093	39,850	.....	*44,692
D. Pender	30,362	35,572	39,335	*42,875
Shaffer	35,606	40,208	41,390	45,546
Bohack	41,069	44,463	42,017	.....

*Standard Statistics

Table IV—Total Number of Grocery, Meat and Combination Stores With Annual Sales Above $200,000

	$200,000 to $299,999	$300,000 to $499,999	$500,000 to $999,999	Above $1,000,000	Total Above $200,000
Year 1929					
Grocery stores	139	58	20	2	219
Combination stores	573	278	86	45	982
Meat markets	193	92	35	3	323
Totals	905	428	141	50	1.524
Year 1933					
Grocery and combination stores	367	205	69	18	659
Meat markets	28	16	4	.....	48
Totals	395	221	73	18	707

Table V—Total Number of Stores With Sales Above $300,000. Total and Average Sales for Years 1929, 1933, 1935

	1929	1933	1935
Number of grocery and combination stores	489	292	479
Total sales of grocery and combination stores	$286,135,000	$153,334,000	$247,080,000
Average per store	$585,000	$524,000	$516,000

Table VI—Summary of the Number and Sales of Grocery and Combination Stores Reporting Sales Volume in Excess of $300,000 for Year 1935

	Total		Chains		Independents	
	Stores	Sales	Stores	Sales	Stores	Sales
Grocery stores	90	$43,793,000	43	$18,412,000	47	$25,381,000
Combination stores	389	203,287,000	204	111,080,000	185	92,207,000
Totals	479	$247,080,000	247	$129,492,000	232	$117,588,000

Merchandising
HINTS AND HURDLES

Citrus Fruit Gains Favor. Cooperation is a great help in merchandising especially when it is lasting. During the period 1919-1923, apple growers supplied 38.92 per cent of the fruit consumed by the nation, citrus fruit growers 15.73 per cent, according to "An Historical Approach to the Marketing Problems of the Apple Industry of Oregon," by J. W. Ellison. Ten years later apples represented but 31.57 per cent of the fruit consumed, citrus fruit 22.10 per cent. The quality of apples has not changed greatly, neither has the quality of citrus fruit. The reason for the shift of favor is not found in the fruit but in the methods of those who grow and sell them. The citrus fruit industry is organized, and it stays organized! Within the ranks there is unity and cooperation. Because of this solidity, constant advertising is possible, market gluts are rare and the crop moves to the market orderly and profitably. The apple growers as a whole have never known enduring harmony or working unity. Gluts and profitless markets have not been rare. Not only would organization help the apple industry, but nearly all branches of the food industries. The food industry as a whole might solve many murky problems, no few of which concern the manufacturer, if there were more cooperation, more unity in the ranks.

Result of Chain Cooperation. The recent concerted drives of the chain stores to move surplus crops are excellent examples of cooperation. The results of these drives are noteworthy. Acting together through their national association, the corporate chains not only moved a bumper crop of grapefruit but increased their own grapefruit sales 274.7 per cent during the two months, January and February, 1937. The grapefruit consumption per capita increased 81 per cent, hence there was no market glut. Surplus crops usually bring falling prices, but the chain stores paid growers a price per box that increased from 25-30 cents per box in December to 75-80 cents per box in March. It is improbable that the chains could have worked efficiently together before the organization of the National Association of Food Chains.

New Market for Ice Cream. Ice cream manufacturers will be interested in two items of news appearing currently, one from a report of the Ice Cream Merchandising Institute, the other from an advertisement of A. & P's. in Baltimore papers. The Ice Cream Merchandising Institute, May 4, 1937, announced "A practical method to keep manufactured ice cream in the home so that the housewife can buy ice cream at any time, store it in the home and serve it at any time." A. & P.'s advertisement in Baltimore papers announced packaged ice cream for sale in A. & P. retail stores. This ice cream, due to special packaging will keep firm for 60 minutes after purchase. It can be stored in the ice-cube compartment of the refrigerator until served. Marketing ice cream, for home use, through retail food stores opens a new field for ice cream manufacturers.

Sausage Makers Cooperate. An educational campaign that does not include a listing of the names of the sponsors has been launched by the Michigan Sausage Manufacturers' Association. The purpose of the campaign is to inform the public on the meaning of the terms used by the industry, especially those terms which refer to quality. This campaign, it is hoped, will raise the consumer rating of local packers' products. The emblem of the Association, which identifies the Association member's product, is featured in the advertising. The campaign will, no doubt, increase sausage sales more than a wave of price concessions.

Model Grocery Sells no Food. A model retail grocery has recently been created in Trenton, N. J., not by food manufacturers to learn more efficient ways to merchandise their product, but by four equipment manufacturers. The sponsors are C. V. Hills & Co., manufacturers of refrigerators, Pittsburgh Plate Glass, General Refrigerating Co. and Hobart Manufacturing Co. This model store apparently is not a salesroom for food, although several food manufacturers supply dummy stock; but a display room for equipment, to serve as a guide to retailers in modeling their own stores and operations.

Chains are Groggy, But. The United States Supreme Court has upheld Louisiana's graduated tax. This will encourage the passage of other similar laws now pending in other states. This legislation was intended to be a body blow to the chains, but the chains are rugged and have a few tricks of their own. The chains' first answer to the new law will be to close the least productive stores, increase the size of remaining units, and convert them to self service and lower prices. They can and will make the spread between the chain and independent greater than before. In general they will carry larger inventories. They will offer greater item variety. Judging from the reaction of independents within the trading area of super-markets, the independents will welcome the new chain units much less than the passing models.

There is no place for manufacturers' point of sale display in this supermarket. Most of the supermarkets rule out all but their own displays. As these food stores increase in number, package design increases in importance.

New PACKAGES

Suggestive of the Orient

"LA CHOY", made by La Choy Products Co., Detroit, familiar in combination packages of chop suey and chow mein noodles, has a newly designed label, suggestive in both color and design of the oriental restaurant.

American type marmalade free from the bitter taste. The container for the marmalade is noteworthy because of the absence of a label on the glass jar. The product alone produces shelf-visibility and eye-appeal. Name, trademark and descriptive matter appear on the lid only.

New Field For Nuts

ALMONDS, peanuts, black walnuts and chocolate cashew nuts may now be purchased in a form which simplifies cooking and opens the way to new and unusual dishes. Called "Cream of Nuts," this new product is put out in homogenized form by the Nunut Foods Co., Plainwell, Mich. The nuts, ground to a fine consistency, mixed with cream, water, sugar, salt and arrowroot starch, have the appearance of a cream sauce. A Cream of Nut recipe book furnishes suggestions for soups, salads, entrees, cakes, cookies and candies.

Puts Sea Tang in Salmon

TAKING A CUE from sausage manufacturers, Deming & Gould is using Angostura bitters to heighten the flavor of its canned salmon. The Bellingham, Wash., packer believes that this brings out the "sea tang" in the salmon as never before. The product is packed in one pound cans identified with a blue label bearing a bright red spot.

Packaged Baked Potato Powder

IDAHO BAKED POTATOES, milled, spray dried and packaged are said to be but slightly perishable and to effect an economy in transportation and storage. "Otato," product of Otato Co., Idaho, was first distributed successfully in 25, 50 and 100 lb. drums to the restaurant and hotel trade, and is now being introduced to the retail trade by department store demonstrators in Chicago and Milwaukee.

New Dress for the Party

COCKTAIL PARTIES require new dresses for Hors d'Oeuvres, as well as the guests. Bidders for this expanding market are repackaging and redesigning containers to tempt the fickle buyers. "EssKay" cocktail sausages, product of Wm. Schuderberg-T. J. Kurdle Co., Baltimore, have recently appeared in newly designed labels and packages. "S-K" sausages are packed in both cans and glass jars.

New Strawberry Season Package

"JANE PARKER", short cake layers, a ready made short cake in two layers, each packed in a shallow corrugated paper cup, is the product of Great Atlantic & Pacific Tea Co.'s bakery. The cake layers are mounted bottom to bottom on an inverted paper plate. They are covered and protected by transparent cellulose, held in place by a card board ring, which clamps the cellulose

Glass Jar Without a Label

A BITTER TANG imparted by the citrus fruit rinds is typical of the English type marmalade. Many children shy away from this type of marmalade to jams, jellies and fruit butters. Hoping to create a strong following among children as well as grown-ups, Ivanhoe Foods Company has introduced an

AND PRODUCTS

to the paper plate after the fashion of an embroidery hoop.

Beans in a Baking Dish

BAKED BEANS in a glass bean pot, which can be safely heated in the oven, then used as a serving dish on the table, have recently been offered to the trade by Maine Canned Foods Co., Portland, Me. The stippled surfaced brown glass container for "Puritan" Dutch Oven beans is free from labels other than a loose colorful collar about the neck of the pot. When this band and the cap are removed the pot is suitable for table use, not only for the original serving of the beans, but as a casserole for serving other dishes.

They Look Like Powder Puffs

TINTED, PASTEL COLORED marshmallows, labeled "Bon Bons," in gay transparent cellulose bags, recently entered the food as well as the drug and confectionery markets. Color variety is accompanied by flavor variety, for each color has its own distinctive flavor. The familiar white marshmallows are also packed in a new transparent bag, brilliant with color. On the bag are printed recipies for marshmallow sauces and desserts. Both are the products of Angelus Campfire Co., Chicago.

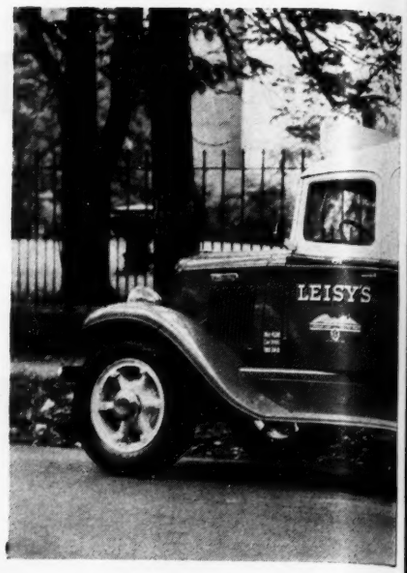
For Sturdy Mass Displays

SPRAGUE, WARNER & Co., Chicago, have redesigned their "Ferndell" and "Richelieu" tea packages, so that a set-back effect on the lid permits standing one can on top of another without danger of toppling. Sturdy mass displays are the result.

Variety Box of Canapes

MANY MANUFACTURERS who have adapted their products and containers to the requirements of the cocktail party have found lucrative new outlets. California Wonderlade Co., Los Angeles, Calif., packs in the same box, a variety of small jars of marmalade, strawberry jams, honey, onions, burrs, and gherkins. A box of twelve "Hollywood Scamps" sells for $1.

Planned Economy in FLEET OPERATION



Sales area, volume of business and types of containers dictate truck sizes and body styles

WHAT PROVISIONS would you make for your delivery equipment if you were starting from scratch in a business or if you were entirely revamping an old fleet? How many trucks would you need, and what should their capacities be? What types of bodies ought to be used? How should the fleet be tied in with the product and with advertising to increase sales? What fundamental maintenance procedure should be set up? And what driver control ought to be established?

To any executive faced with the responsibility of answering these questions, the experience of Leisy Brewery, Cleveland, should prove of value. Leisy's was founded in 1862. In 1918, the last year before Prohibition, it brewed 565,493 bbl. In 1919, the brewmaster stopped production. Tanks were emptied, and machinery, kettles, vats and tanks were ripped out and sold in South America and Canada.

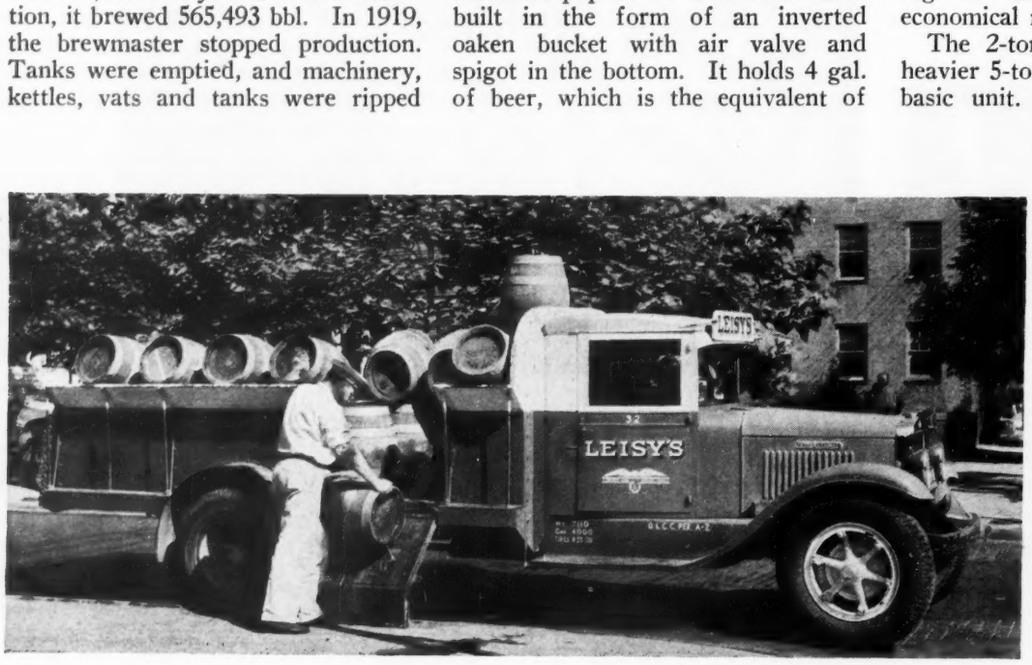
So in 1934, when Leisy prepared to resume operations, a variety of up-to-date equipment had to be procured. This included not only huge glass-lined tanks and the latest in coolers, bottling machinery, conveyors and what-not, but an entirely new delivery fleet.

That no "white elephants" would be bought with the delivery equipment, an analysis of the sales area was made, and an anticipated volume was set up. The volume was broken down into classifications by container—keg beer, bottled beer in cases and beer in growlers. Lest there be some confusion, the growler is a container popular in Cleveland. It is built in the form of an inverted oaken bucket with air valve and spigot in the bottom. It holds 4 gal. of beer, which is the equivalent of a $\frac{1}{8}$ bbl. keg. These growlers serve especially well for home parties and for picnics. They are advertised in the Leisy radio programs, and deliveries are made any time up to midnight.

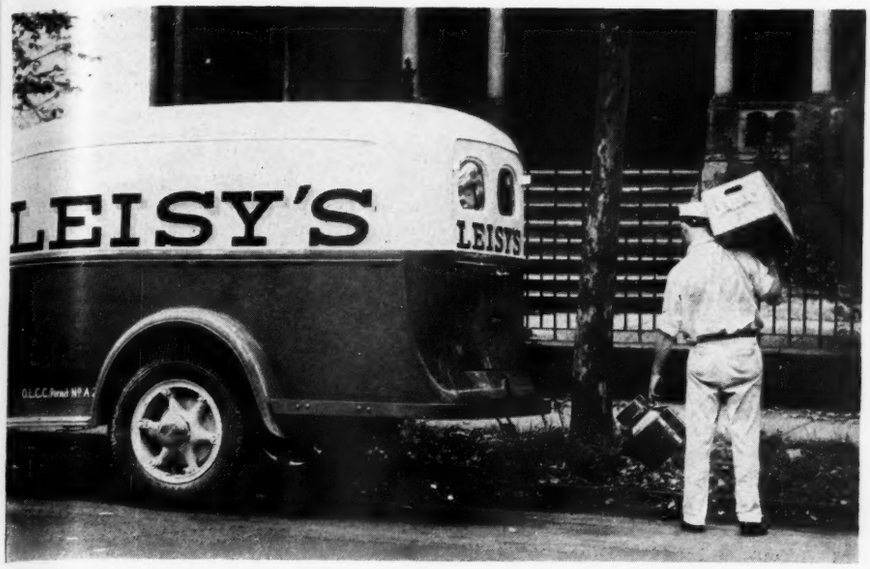
From the sales analysis as to volume, delivery area and number of outlets, Leisy determined that there should be a certain number of keg routes, case routes and combination case-and-keg routes. Then provision was made for special deliveries, particularly in connection with the growler business.

Next, the company decided upon the size, or load capacity, of the basic unit in the fleet. And consideration was given to the value of standardizing as to size to provide an economical maintenance set-up.

The 2-ton truck, rather than the heavier 5-ton job, was selected as the basic unit. The 2-ton vehicle not



One of ten 2-ton trucks with flareboard body used by Leisy. The body is capable of carrying 55 half-barrels or 150 cases. Easy unloading is made possible by hinged side panel. Note company name on front of cab and on door. Trademark is painted on door, too.



One of two 1½-ton trucks with 9-ft. panel bodies used by Leisy Brewery, Cleveland, for special deliveries of cases and growlers. A growler may be seen in the driver's left hand.

the product and the company advertising is made by doing three things: Painting the vehicles in the standard company colors—cream and dark blue; employing the standard style of lettering in the word "Leisy's" where it appears on the trucks; and reproducing the trademark on each cab door immediately below the company name.

The men who operate this well-planned fleet of trucks for Leisy are

only costs less, but it is more mobile on city routes. For special delivery work, however, ¾-ton and 1½-ton trucks were purchased. And for suburban case or keg routes, where the use of the smaller 2-ton trucks would require second trips, 3-ton units were bought.

Another result of the study was the purchase of a standardized fleet, consisting entirely of Internationals. The fleet includes 28 trucks of which 23 are 2-ton units; two 3-ton; two, 1½-ton, and one, ¾-ton.

Ten of the 2-ton jobs are equipped with flareboard bodies. These are assigned to combination keg and case routes, and each carries 55 half-barrels or 150 cases. The flareboard body also is used on the two 3-ton vehicles which cover the suburban routes and on the ¾-ton special delivery truck.

To make unloading of kegs and cases easier, the flareboard bodies are equipped with hinged side panels, these being located near the front on the right. These panels may be swung downward until they rest on the sidewalk or curb, thus serving as a rollway or slide for the kegs or cases.

Open-platform bodies with front and rear crosswise panels are installed on eight of the 2-ton units which deliver exclusively on keg routes. Forty half-barrels are loaded on these bodies, arranged in a center row on end and three tiers sidewise on each side. This arrangement enables the driver to take a keg anywhere from the side without shifting the load or climbing all over it to find what he wants.

One of eight trucks fitted with a platform roll-off body for deliveries on Leisy's keg routes. Note method of loading the kegs.

Panel bodies are used on the remaining five 2-ton trucks serving the heavier case routes. The panel type was selected to prevent thefts and to protect the load from the weather. Several different kinds of beer may be hauled at the same time in these bodies, because sliding doors on the sides and double doors at the rear give easy access to any part of the load.

Nine-foot panel bodies are installed on the two 1½-ton trucks, these being used principally for the delivery of growlers. The beer in the growlers is kept cool by placing dry ice in a paper container on top of each growler and then covering the load with an insulating blanket. This arrangement eliminates the need for refrigerated bodies.

A tie-up between the truck fleet, driver salesmen. They are not expected to do anything to the trucks except drive them. They are not permitted to change tires. Each driver wears a tan uniform, and in winter, a blue jacket. Summer and winter caps complete the ensemble. Uniforms are laundered three times a week at company expense.

Leisy believes in keeping its trucks rolling, and in an effort to reduce idle standing time, each vehicle is equipped with an instrument which records the exact time of operation and the duration of all stops.

Not content with achieving high efficiency in operation, Leisy has gone after more economy in maintenance. It has reduced the necessary stock of spare parts and otherwise curtailed maintenance costs by standardizing on one make of truck.

The PLANT NOTEBOOK

Valves in High Locations

As far as possible, valves should not be installed in positions high above the operating floor. However, sometimes valves must be so placed. In such cases it is a problem to get at these valves quickly, in order to open or close them. And, too often, an accident may result from a hurried trip up a ladder for this purpose.

Valves on runs of piping in horizontal overhead position, when fitted with open valve wheels, can be operated easily by means of a pole having a fork made of two protruding pins on one end. These pins are thrust upward through the openings in the wheel, and by turning the pole the valve may be opened or closed. For turning large wheels on heavy valves, the pole is fitted with a crossbar handle to increase the leverage. In cases where such a valve is operated frequently, the pole can be permanently installed, becoming to all purposes a part of the valve stem. The lower end of such a permanently installed pole should be high enough from the floor to clear the heads of the operators.

Valves mounted high above the floor on vertical runs of piping are more difficult to handle, as the valve stem is in a horizontal position and any operation from the floor must be applied to the edge of the valve wheel. One of the best methods to follow is to replace the ordinary valve wheel with a sprocket. This is equipped with a loop of chain, hanging down low enough to be reached from the floor, and held on the sprocket by metal loops passing over the chain with enough clearance so that the chain operates freely.—JOHN E. HYLER, *Peoria, Ill.*

Hook For Meat Plants

In a meat plant where carcasses are conveyed from one part of the building to another, it was found that the gambrels upon which the carcasses are hung did not slide readily along the conveyor rail. This was because there was too much friction between the rail and the hook at the point of contact. To make the movement easier, the rail had to be smeared with grease from time to time. And the part of the hook which slid on the rail, as shown in Fig. 1, had to be rounded sufficiently so as not to shear the grease from the rail.

To overcome this inconvenience, a roller type of hook is now used, as shown in Fig. 2. The lower, or hook end is not shown in this drawing. A single concave roller with double angular outside diameter, mounted on two ball bearings, is assembled into the opening at the upper part of the forged gambrel. The angle of contact formed is approximately 60 deg., allowing the gambrel to find its own center on the conveyor rail when loaded. One screw stud holds the bearings, spacer and grease retainers in place. Because of the slow speed at which the bearings rotate, the original supply of lubricant, packed in at assembly, lasts a long time.

Experience with this roller type of gambrel in meat plants indicates that it has eliminated much worker fatigue, so that a man can move about 50 per cent more meat in a given time than formerly. This type of hook has been patented in Denmark.—FRED ADAMS, *New York, N. Y.*

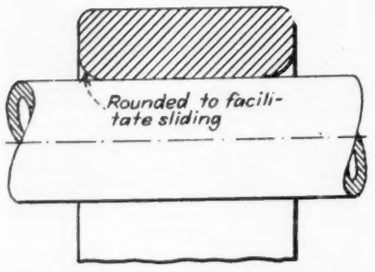


Fig. 1—The former style of meat hook rode on the conveyor rail in this way.

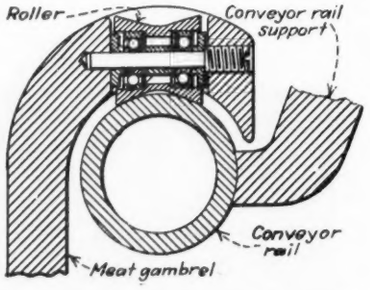


Fig. 2—This ball bearing roller type of meat hook makes the handling work easier so that a worker can move more meat per hour.

Measuring Milk Films During Irradiation

Because of the increased use of irradiated fluid and evaporated milk, experimenters in the dairy department of the University of Wisconsin have been seeking to improve the process and apparatus employed.

Since ultra violet light will not penetrate very far into milk, investigators have found it necessary to expose the milk to the light rays in a thin film. The vitamin D potency of the milk is in direct relation to the intensity of the light, the thickness of the film, the velocity with which the film moves, and the time it is exposed to the light. An accurate method of measuring the thickness of the film, which in commercial work has varied upward from .005 in., has been sought.

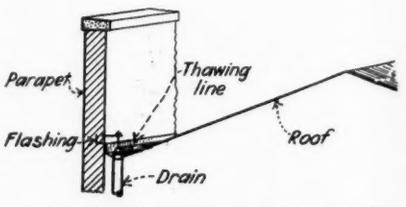
A successful procedure for making such measurements has been announced by H. H. Beck, K. G. Weckel and H. C. Jackson of the dairy staff of the University, in cooperation with the Wisconsin Alumni Research Foundation.

The method used is to project a very narrow beam of light onto the metal surface of the irradiation apparatus at an angle of incidence of 45 deg. The reflected beam may then be measured. A film of milk is then allowed to run over the apparatus and the change in the position of the reflected beam is measured. Since the two reflected beams are parallel, the distance between them can be determined and thus the thickness of the milk film can be calculated by applying the principles of geometry.—R. G. SILBAR, *Milwaukee, Wis.*

Thawing Line Prevents Roof Leakage

While memories of roof leakage, caused by frozen accumulations of snow and ice in gutters and drains are still fresh in mind, it is a good time to plan to avoid similar occurrences next winter. A steam line, as shown in the sketch, will keep such places clear and prevent water from rising above the protection afforded by the flashing.

These thawing lines should have sufficient slope to provide adequate drainage. And they should be supported at a sufficient number of points to avoid any low places in which water can accumulate. Pipe used should not be smaller than $\frac{3}{4}$ in., and the line should be provided with a bleed valve or trap at its lowest point. If a valve is used, drill the disk, so that there is no possibility of complete closure.—S. H. COLEMAN, *Roanoke, Va.*



A thawing line should be installed to keep roof drainage clear in winter.

Vapor-Tight Storage Rooms

Optimum conditions for apple storage, it is generally agreed, are a temperature of approximately 32 deg. F. and 90 per cent relative humidity. The high humidity is desirable to prevent wrinkling and loss of weight. To provide the air in storage rooms with sufficient moisture, artificial humidification frequently is provided.

The humidity problem has been solved in another manner, however, in two apple storage rooms built last summer at Old Orchard Farms near Champion, Ill., owned by George Livingston, president of the Millers' National Federation. By making the walls of the storage rooms highly resistant to the passage of water vapor, a relative humidity of 90 per cent or more is maintained without artificial humidification.

The two storage rooms were designed by William L. Landis, refrigerating engineer of Ivesdale, Ill. Each room is 29 ft. wide and 40 ft. long. The height of one is 8 ft. and the other 9 ft.

The high vapor resistance of the walls is due primarily to the use of a non-metallic, reflective-type insulation called Silvercote fabric, three layers of which are used. This material is said to be highly resistant to penetration by water vapor. It consists of two external sheets, each coated on the outer surface with a mineral pigment which is polished to a highly reflective surface. The sheets are laminated together with asphaltum and reinforced with a ½-in. mesh of jute cords imbedded in the lamination. A further vapor seal is provided by a moisture-proof membrane covering each exterior polished surface.

This insulating material is applied with a ¾ in. air space between layers. The application provides an effective moisture seal for the wall because all edges of the sheets are covered by the furring strips which separate the layers. Specifications call for the treatment of the furring with asphalt.

The two storage rooms are built one above the other. The ceiling of the upper room is treated with additional insulation in the form of a coreboard which consists of a rigid fiber core, the liners of which are treated in the same manner as the surface of the insulation fabric. This coreboard forms the ceiling surface of the room.

The insulation not only provides a vapor seal for the wall but is itself resistant to the effects of moisture, its surfaces being said to be equal in this respect to lead foil. Its coefficient of conductivity (.33—Peebles and Rowley) is not affected by ammonia and water vapors encountered in refrigeration, according to tests made by Dr. Kenneth A. Kobe of the University of Washington. The non-metallic nature of the surfaces eliminates loss of efficiency by oxidation.

The cooling equipment used to refrigerate the two rooms is of conventional design. The refrigerating coils consist of 1¼-in. steel pipe with 1 ft. of pipe for each 8 cu.ft. of storage space. The system is of the flooded ammonia type using a high pressure Alco float valve and a surge drum 10 in. in diameter and 8 ft. long. A 5-ton Baker ice machine is used, automatically controlled by a thermostat in the upper room and by valves and bypasses in the lower room. The machine is driven by a 7½-hp. motor which also drives a small water pump for circulating the condensing water. An automatic Hancomake water valve is used to care for the condensing water in the event the pump fails to work.

The refrigerating system also serves an 8x10 ft. service box which maintains temperatures from 30 to 36 deg. F.

The storage rooms already built are designed so that two more rooms 20x25 ft. may be added. The refrigerating system is also designed so that any room may be operated alone or in conjunction with the others as is desired. Since they were put into service this fall the rooms have constantly maintained relative humidities close to 90 per cent, the wet and dry bulb readings differing by about one degree.—Source of information, SILVERCOTE PRODUCTS, INC., *Kalamazoo, Mich.*

The Plant NOTEBOOK

Steam Separators for Steam Pumps

In cases where it is hard to keep a pump properly lubricated, and especially in cases where chattering is noted as a result, the trouble can often be alleviated, and in many cases entirely eliminated, by the proper use of a moisture separating device in the line. There are many different kinds of separators available. Some operate on the principle of forcing the steam to make a sudden turn, which throws out the condensate at the turn and forces it downward into a receiver with a drain at the bottom. Other separators use different methods.

The cost of a separating device might be considered an unnecessary expense; but there are many cases where such a mistaken idea of economy has been pursued and the additional oil necessary to operation due to the washing action of the wet steam will in a short time add up to greater value than the separator. When it is remembered that the saving of oil is coupled with more satisfactory pump operation, it will be seen that the separator is a very good investment.—JOHN E. HYLER, *Peoria, Ill.*

Upper apple storage room at Old Orchard Farms near Champaign, Ill., has additional insulation in the form of coreboard

Lower apple storage room at Old Orchard Farms near Champaign, Ill. showing fabric insulation on walls and ceiling

UNIFORMS

Who Should Launder Them?

SANITATION, safety to worker, and improved morale are among the chief incentives for the adoption of standard uniforms for employees engaged in food manufacturing and packing. Their use for these purposes has proved so successful that uniforms are now widely used in all types of food plants.

The manner in which the expense of supplying and laundering the uniforms is handled varies so widely that these questions are still being asked: (1) Should the company or the worker pay for the uniform? (2) Should the company or the worker be responsible for the laundering? (3) Who should decide upon the design of uniform and when or how often the uniform should be changed? (4) Should uniform regulations apply to men as well as to women workers?

Employees Supply and Launder Uniforms

1. Employees should pay for their uniforms. Personal ownership guarantees better care and more personal pride in the condition of the uniforms, which would not otherwise be the case. (Exceptions to this are special overalls for warehouse men. These should be provided by the company.)

2. Employees should be responsible for the laundering of their uniforms, with the exception of the warehousemen's overalls, which are heavy and not only are hard to launder, but present special cleaning problems. There are laundering companies who specialize in overalls, and for a fixed sum provide the garments, launder and repair them, and replace any that become torn or worn out.

3. Employers should decide upon the design of the uniform and should designate when and how often the uniforms should be changed.

4. Uniform regulations should apply to men as well as women, with exceptions previously given.

In our experience thus far we have not provided uniforms for our men, but this is a matter which will be decided at an early date.—C. A. HARMEIER, *P. Duff & Sons, Inc., Pittsburgh, Pa.*

Changes Uniforms Twice Weekly

For many years the practice of this company has been to furnish clean uniforms to the men and clean gowns to the women employees. Clean caps are also supplied.

All production employees wear white and all maintenance employees wear blue uniforms. Changes are made twice weekly.

It has been the desire of the management to have the employees' clothes neat, clean, and uniform. Consequently, in addition to furnishing two uniforms to each employee we found it necessary to install our own laundries to do the laundering at company expense.

Both the gowns and the uniforms are designed to protect the worker in every possible way, both as to cleanliness and safety. In addition, each employee is manicured at company expense at least once every ten days.

If an employee is careless with his uniform or has an accident causing the uniform to become soiled before the half-week period is ended, a clean uniform is supplied to him without delay. If it is apparent that the uniform was soiled or torn deliberately the employee is censured.

At the time each employee comes to work, a deposit of one dollar is made against his uniforms. This deposit, however, is returned to him if and when he severs his connection with the company.

The production manager reporting directly to an officer or director of the company is largely responsible for formulating and carrying out the rules pertaining to uniforms.—D. R. GRANT, *Beech-Nut Packing Co., Canajoharie, N. Y.*

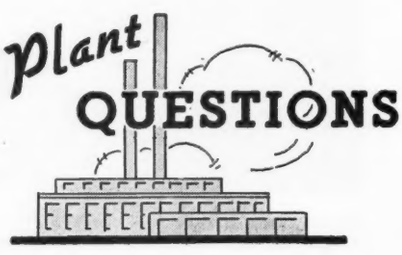
Men Are Uniformed

We feel that the workers should pay for the uniforms. When that policy is followed the uniforms will receive better care than if the uniforms are supplied. Also the workers should be willing to pay for them as they are cheaper garb for the men than is the usual type of clothing.

The worker should be responsible for the laundering too. Particularly in the case of woolen uniforms for the salesmen there is a saving over keeping the customary street suit in presentable condition. Woolen uniforms require cleaning once a week and involve an expense of only 50 cents per week.

Design of uniforms should be decided by the company. The frequency with which they are changed depends upon the material from which they are made. Woolen uniforms require changing only once a week. Cotton uniforms need to be changed two or three times each week because they become badly wrinkled and are otherwise in need of a cleaning. It is better for the company to send the uniforms out to be laundered and have the worker pay the company for this service.

Although we have no women workers in our plant we think that uniform regulations should apply to both types of employees when women too are employed.—CARLOS S. PICKERING, *Olson's Bread, Los Angeles, Calif.*



Rest Next Month

Remaining answers bringing out different methods of handling the problem of uniforms in food plants will appear in next month's issue.

New DISCOVERIES AND INVENTIONS

BAKERY PRODUCTS

Active Soybeans Destroy Vitamin A

LEGUME SEEDS, particularly soybeans, improve the color of the crumb of the loaf of bread when used in suitable proportions. The bleaching action is due to an oxidation of the carotene in the flour, but if the soybeans are heated above 50 deg. C. they are inactivated and no longer possess this property. It has been found that the vitamin A potency is also destroyed by this oxidation of carotene. And furthermore, the active soybean can destroy at least 99 per cent of the vitamin A in cod liver oil.

Digested from "The Effect of Active Soybean on Vitamin A," by Frey, Schultz and Light, *Industrial and Engineering Chemistry*, 28, 1254, 1936.

BEVERAGES

Quality Control in Wine Making

ACCORDING TO RECENT OBSERVATIONS MADE at the Enological Laboratory, Algerian Institute of Agriculture, the flavor, color, clarity and keeping quality of wines are profoundly influenced not only by the acidity but also by the kind and extent of partition between acidic and basic ions in the wine. A careful distinction is made between free acid content and total acidity, which includes both the free acid and the titratable combined acid.

According to tests made with Algerian wines, which contain tartaric, malic, lactic, succinic and acetic acids, a wine of normal acidity has a free acid content represented by a pH value from 3.0 to 3.4 and is quite acceptable in flavor, color, clarity and keeping quality. It has a medium proportion of combined acid.

A high acid wine (pH value below 3) is exceptionally clear, with very bright color, and keeps excellently. It contains relatively little combined acid and much free acid.

A flat, insipid wine may be no lower in total acidity than the others, but its acid is proportionately more in the combined than in the free state and its pH value is above 3.5, corresponding to low free acidity. Such wine is generally dull in color, cloudy, and contaminated with "wine sickness" organisms. These facts have an important bearing on quality control and storage of wines.

Digest from "Complete Balance and Partition of Ionizable Substances in Wines," by Ernest Bremond, *Bulletin de le Societe Chimique* 4, 296, 1937.

CANNED AND FROZEN FOODS

How Sweet Corn Holds Its Vitamin C

RAW, fresh cooked (cut or cob), frozen and whole grain canned corn are all moderately good sources of Vitamin C. They have between 40 and 60 international units per ounce even after the rigors of the various treatments. Cream style canned corn runs a little lower than whole kernel.

Little loss of Vitamin C occurs after picking and storage for a few days. This retention of Vitamin C carries over to defrosted frozen corn and canned corn held under refrigeration for several hours.

Digest from "Stability of Vitamin C in Sweet Corn to Shipping, Freezing, and Canning," by Dunker, Fellers, and Fitzgerald. *Food Research*, 2, 41, 1937.

Fermenting and Preserving Citron

FRESH PUERTO RICO CITRON is cut into longitudinal halves or caps, submerged in either sea water or 5-8 per cent salt (NaCl) solution. Renew the brine after fifteen days. Cure is complete after 40 to 50 days. The caps are now transparent. Brine strength is now raised to 10 or 12 per cent salt. The latter step is necessary or the citron will soon soften excessively and lose its characteristic color and flavor.

Sulphur dioxide, either as SO_2 or NA_2SO_3, to the extent of 200 to 500 parts SO_2 per million will preserve fermented citron in brine as low as 5 per cent. The SO_2 is later removed during the desalting operation preparatory to preserving.

Final manufacturing consists of: 1. Desalting by boiling the halves in twice their weight in water. 2. Then soak the halves in running water for several hours. This reduces the salt content to 1 to 2 per cent. 3. Pulpy centers are now removed by hand and discarded. 4. Begin building up, over a period of several days, the sugar content of the flesh by hot syrups, starting with 15 to 20 per cent syrups and ending with 75 per cent syrup. The syrups are usually mixtures of cane and invert sugar and glucose, e.g., sucrose, 65 per cent, glucose 35 per cent. This takes about 10 days. 5. Drain off final syrup. 6. Dry the halves in a hot air kiln. Requires twelve hours at 120 deg. F.

Pure sucrose gives a peel too firm because of crystallizing. Glucose in the syrups improves the quality. There is no molding or fermenting of peel having a moisture content of 17 to 18.5 per cent even after it has undergone long periods of storage.

Complete chemical analysis of fresh and preserved fruit is given. Also vitamin data.

Digest from "Chemical Composition and Fermentation Studies of Citron" by C. R. Fellers and E. G. Smith, *Journal of Agricultural Research*, 53, 859, 1936.

Why Frozen Peas Must Be Stored At Low Temperatures

IF PEAS are properly blanched (scalded), then frozen, and held at —5 to 0 deg. F., they retain their bright green color. If the storage temperature is 20 deg. F., though they remain frozen, the color slowly changes from bright green to greenish yellow and then to greenish brown. This change also occurs at 15 deg. F., but somewhat more slowly than at the higher temperature.

The cause is the slow transformation of the green chlorophyll into yellow brown phaeophytin as a result of the action of acids in the cell sap. These cause the magnesium to split from the chlorophyll molecules. Probably the greenish brown color of peas that have a trace of souring during delays before

(*Turn to page* 347)

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Milk Bottle Hooding Machines

PACKAGE MACHINERY Co., Springfield, Mass., now has available two models of machines for placing transparent cellulose hoods on milk bottles. One of these is fully automatic, operating at 35 to 36 bottles per minute. The other is semi-automatic and has a speed of 26 bottles per minute. The object of these machines is to place over the conventional paper cap, on a grade B bottle of milk, a sanitary and tamperproof seal, at little cost. The manufacturers state that one thousand bottles can be hooded with these machines at a cost for material of 98 cents.

Beer Barrel Reconditioner

HARNISCHFEGER CORP., Milwaukee, Wis., has developed an automatic pitching machine for use in reconditioning beer barrels. Four of these are installed in the Schlitz Brewery, with an average capacity of 32,340 barrels per week.

These machines are designed with a stationary beam 70 ft. long. By means of a carrier or walking beam, barrels are put on at one end and transported from station to station. At succeeding stations, they are automatically preheated, sterilized, pitched, drained, defumed and cooled, prior to refilling and closing.

In pitching, a revolving spray nozzle enters the barrel and the interior is sprayed with molten pitch. Either metal or wooden barrels can be handled.

Check Weigher for Packages

A MACHINE for checking the weight of filled packages has been put on the market by The Fred Goat Co., Inc., 320 Dean St., Brooklyn, N. Y. It is designed to avoid overfilling of packages; to automatically cull underweight, partly filled, or empty containers; to automatically warn when loads are running off weight; and to protect against error or carelessness on the part of the operators. It will function with accuracy with a minimum tolerance setting of plus or minus 0.25 per cent of the gross weight at a speed of approximately 35 packages per minute; or higher speeds when the tolerance is increased.

Refrigerated Truck Bodies

FIVE NEW REFRIGERATED TRUCK BODIES, including automatic, holdover and dry ice types are being manufactured by General Electric Co., Schenectady, N. Y. These bodies are designed to be mounted on standard 1½ or 2-ton chassis.

In these bodies, all the body space is load space, as the refrigerating units are located in the skirt compartment. Weight is saved by using glass wool and Thermocraft insulation.

In the automatic type, power to drive the refrigerating unit is obtained from the truck motor by means of a power take-off device and an electro-magnetic clutch. The clutch operates the condensing unit through a temperature control relay, maintaining a constant temperature in the body. This clutch is also interlocked with the driver's clutch pedal to disengage the compressor load when the driver is shifting gears. Provision is made to operate the condensing unit overnight, when the truck is not in operation, by means of auxiliary electric motor equipment which can be plugged into any standard power supply line.

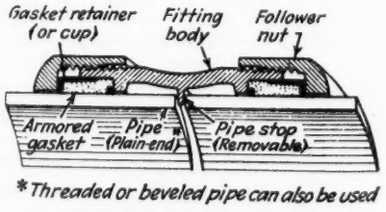
In the holdover type, cooling is provided either by a refrigerator unit mounted in the skirt compartment, or by connecting to the ammonia system at the main plant. The dry ice type can be charged from inside the body, and cooling is distributed by a special aluminum plate.

All of these bodies are built from cold rolled sheet steel, beaded to increase rigidity and to improve appearance. The insulation is sealed in moisture proof walls, to maintain its efficiency. Galvanized sheet steel forms the inner linings and is surrounded by 6 in. of insulation, glass wool on roof and floor and Thermocraft on walls.

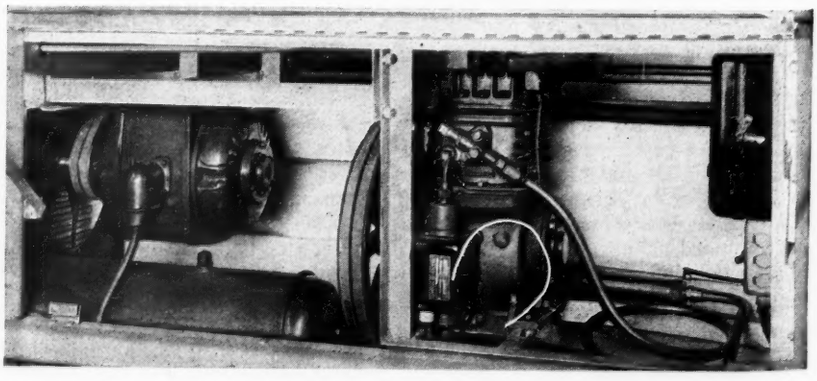
Bodies have three compartments of equal size. The two forward compartments are comprised of one large liner divided by an adjustable sheet metal partition. The rear compartment is a separate liner insulated from the compartment ahead.

Pipe Threading Eliminated

SUCH TIME CONSUMING OPERATIONS as cutting pipes to exact lengths, threading, grooving, flaring, and screwing up joints can be eliminated, according to S. R. Dresser Mfg. Co., 457 Fisher Ave., Bradford, Pa., by use of the new Dresser Style 65 fittings.



Thread eliminating pipe fitting.



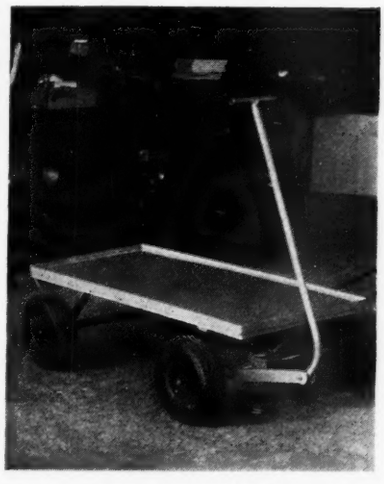
Refrigeration unit in skirt compartment of new General Electric refrigerated truck

With these, plain-ended pipes are inserted into the fittings and the threaded, octagonal follower nuts are tightened. As this is done, resilient, "armored" gaskets at each end of the fitting are compressed tightly around the pipe, forming a positive seal. The resulting joint is not only tight, but also absorbs normal vibration, expansion and contraction, and permits deflections of the pipe in the joint. If the pipe is already threaded, it can also be joined in the same way.

The complete line of Style 65 fittings includes standard and extra long couplings, 45 and 90 deg. elbows, and tees. These are available in standard steel pipe sizes, ½ to 2 in., inside diameter, black or galvanized.

Service Truck

FOR USE BY SERVICE MEN, repair men and maintenance departments, Saginaw Stamping & Tool Co., Saginaw, Mich.,

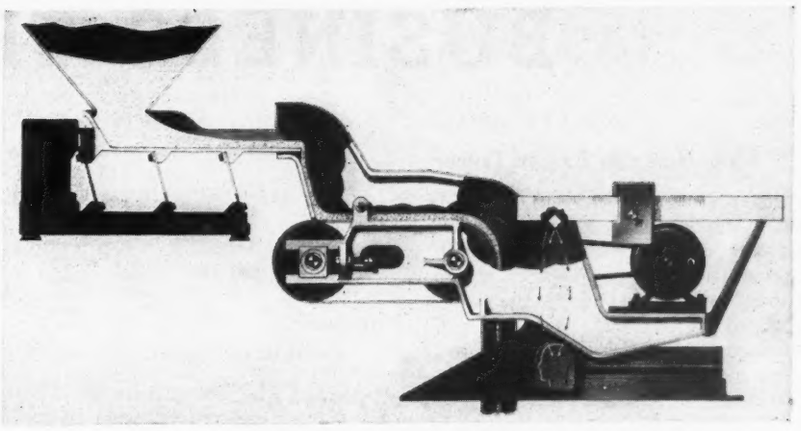


Factory service truck for maintenance work.

has developed the pneumatic-tired truck shown in the illustration. Its purpose is that of transporting tools, supplies and maintenance materials from one part of a plant to another. It is of ball bearing fifth wheel construction and has antifriction bearings in the wheels, to permit short turning with easy running.

Air Pressure Regulator

DEVILBISS Co., Toledo, Ohio, is manufacturing a low capacity regulator, the Type HFS, for sensitive regulation of air pressures below 30 lb. The device has a 4 in. diameter diaphragm, giving a sensitivity six times as great as would a 1½ in. diameter diaphragm. With it, regulated air pressure can be graduated up to 30 lb. with but 1 oz. variation for each 10 lb. variation of main line pressure. That is, a variation of 40 lb. in the main line will cause a variation of only 4 oz. in the pressure of the regulated air.



Precision weighing vibrating feeder

Precision Weighing Machine

JEFFREY MANUFACTURING Co., Columbus, Ohio, has introduced a new precision weighing machine for use in continuous weighing, feeding, batching and proportioning. This device is called the "Waytrol." It combines all-electric vibrating feeding, a synchronous weigh belt on a scale beam so pivoted as to receive material at the most sensitive end, and an automatic all-electric control sensitized through a device called an "Electric Brain."

On this unit, feeding and weighing are physically separated processes. The rate of feed to the weigh belt, which travels at constant speed, is not dependent upon the volume of material handled but is governed directly by weight by the control, which registers any slight disturbance of the belt and makes instant correction of the speed of the feeder. For dustless operation and to avoid the possibility of error caused by wind pressure, the entire unit is enclosed in steel and glass. It operates from any standard 60-cycle lighting circuit. It is available in sizes handling from a few pounds up to many tons per hour. The smallest will handle granular material weighing 100 lb. per cu.ft. at a rate that can be varied from several pounds to a maximum of 4,000 lb. per hour. Its accuracy is claimed to be within 1 per cent.

Electric Flow Meters

BRISTOL COMPANY, Waterbury, Conn., has announced a complete line of electric flow meters for steam, liquids and gases, in addition to its regular line of mechanical flow meters. The new instruments operate on the "Metameter" principle of telemetering, which has been used for several years on instruments for remote recording or indicating. They are furnished for recording, integrating and indicating flow. The readings are transmitted over a two-wire circuit which does not enter into the calibration of the instrument. All electrical contacts are enclosed in glass. A standard Bristol meter body is employed to measure the differential across an orifice. High accuracy is claimed at all points of the scale.

Daylight Light Source

FOR COFFEE ROASTING, sugar refining and other industries, where a lighting with properties similar to daylight is desired, Barkon-Frink Tube Lighting Corp., Bridge Plaza South, Long Island City, N. Y., has developed a new lighting tube. This is a carbon dioxide filled tube of the ionized gas type, similar in general to the familiar neon lighting units. Its luminosity curve closely approximates that of daylighting from north windows on days when the sky is cloudy.

Portable Mixers

PATTERSON FOUNDRY & MACHINE Co., East Liverpool, Ohio, has recently redesigned its entire line of portable mixer units, embodying improvements to increase the portability. Reduction in weight has been attained by the use of aluminum in the construction of the motor frame, end bells and lower housing. This saves 10 lb. in the ¼ hp. size.

Link Steel Conveyor Belt

ACME STEEL Co., 2840 Archer Ave., Chicago, Ill., has developed a "Flat-Top" link steel belt for conveying purposes in bakeries and other food plants. The belt is made up of individual flat surfaced links of galvanized or stainless strip steel joined by wire spindles. The wires are of self-locking design, with ends protected by flanges on the underside of the belt.

This belt can be drawn over small or large pulleys. Ridges on the under side of the belt provide a continuous level surface for idler rolls. Widths available are multiples of 1 in., to fit all sizes of conveying equipment. The belt is supplied in both solid and perforated types.

BUSINESS TRENDS

Raw Material Prices Lower

PROSPECTS for more ample yields of many important food crops in 1937 have at last combined with caution in the speculative market to effect a general, though slight, decline in the somewhat inflated prices of raw food commodities. Burned in the wild gyrations of the first four months of the year, amateurs seem to have lost much of their interest in speculation. With this irresponsible element out of the market, it is likely that prices will reflect the realities of the commodity situation with more accuracy for some months to come.

An indication of what has happened in the last few weeks is given by Professor Irving Fisher's index number of average commodity prices. On April 16 this index stood at 94.5, April 23 at 94.3, April 30 at 93.8, May 1 at 93.5, May 8 at 93.3, and May 15 at 92.7. With the 1937 crop season getting under way, it is likely that this decline will shortly be arrested at a level which is based on prospects for this years' supplies.

Fats and Oils

ILLUSTRATION of this price situation is given by the recent performance of coconut oil. Scarce, and high in price throughout the winter, about two months ago this oil began to be available again in more ample supplies. From a level above 10 cents per lb., the price dropped to around 6½ cents in mid-May. While the decline is expected by some to continue until a price of about 5½ cents is reached, supplies of copra and coconut oil are still low enough to have caused the price to become firmer in mid-May and to make rather unlikely any immediate further considerable decrease in the price level.

Construction News

	Pending (thousands)	Awarded May (thousands)	Total Awarded 1937 (thousands)
Bakery	$40	$140	$654
Beverages	595	695	4,822
Canning and Preserving	150	....	840
Confectionery	40	....	....
Grain Mill Products	....	380	177
Ice Manufactured	....	....	205
Meats and Meat Products	680	....	1,053
Milk Products	310	2,160	4,543
Miscellaneous	785	765	4,820
	$2,600	$4,140	$18,694

Factory consumption of refined coconut oil for the quarter ending March 31, was 57,599,012 lb. Factory and warehouse stocks on March 31, 1937, totaled 12,169,375 lb. Factory consumption of some of the other important refined vegetable oils in the first quarter of this year was as follows: cottonseed oil, 322,390,009 lb.; peanut oil, 17,702,882 lb.; corn oil, 18,297,975 lb.; soy bean oil, 49,598,567 lb.; and olive oil, 747,894 lb.

Wheat Prospects

ON THE BASIS of the May crop estimates, the winter wheat situation still appears to be favorable. The present, Government estimate is for a total yield of 654,295,000 bu., compared to the April estimate from the same source of 656,019,000 bu. Private estimators, on May 1, looked for a total of about 652,000,000 bu. The acreage for harvest is now estimated at 47,410,000 acres, indicating an abandonment of 17.1 per cent.

Spring wheat acreage is estimated to be about 22,000,000 acres, compared to 23,912,000 acres seeded last year.

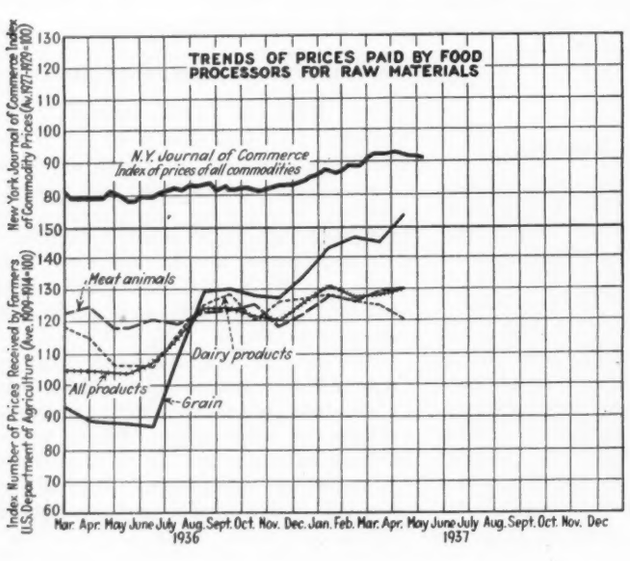
Larger Acreages For Canning Planned

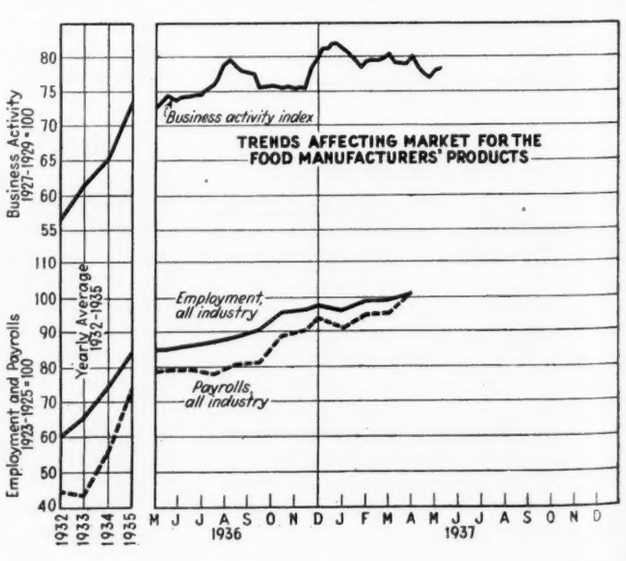
ALWAYS PROVIDED that the weather during the current growing season proves favorable, there should be somewhat larger outputs of some canning crops this year than in 1936, if intended acreages are any indication. It is expected that the total acreage of sweet corn for canning will be 450,720 acres this year, which compares to 444,370 acres planted to this crop in 1936, 418,990 acres in 1935, and 323,590 acres in 1934.

Proposed acreage planted to snap beans for canning is also greater this year than in 1936. The prospective 1937 plantings are now reported to total 58,050 acres, compared to 55,910 acres planted last year. With average yield, this acreage would give a production of about 7,000,000 cases, which compares to an actual pack in 1936 of about 6,400,000 cases of 24 No. 2 cans each.

Intended acreage for beets for canning is also higher this year, with an estimate on May 1 of 11,320 acres. This compares to a planted acreage in 1936 of 10,080 acres. Kraut packers report intentions to increase the 1937 plantings of cabbage for kraut to 9,850 acres, compared to 8,410 acres planted to this crop in 1936. Intended acreage for cucumbers for pickles is also higher, with a figure this year of 110,990 acres, compared to plantings last year of 100,250 acres.

In contrast to these increases in acreage, present indications are for a smaller


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
New York Journal of Commerce Index of Commodity Prices (Av. 1927-1929=100)
N.Y. Journal of Commerce Index of prices of all commodities
Index Number of Prices Received by Farmers U.S. Department of Agriculture (Ave. 1909-1914=100)
Meat animals
Dairy products
All products
Grain
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec
1936
1937



Business Brightens

AFTER DROPPING to a new 1937 low during the third week of April the curve of business activity has been turning upward. According to the *Business Week* index the curve stands at 79.0 per cent of "normal." This is a gain of 1.28 per cent for the four weeks ending May 15; 2.86 per cent above the April 24 low.

Continuation of labor unrest, financial uncertainty with likelihood of further decline in commodity prices, semi-drought conditions in Middle West, and cold wet spring weather in the East added to the threatening clouds of politico-economic Supreme Court decisions are factors which are being a brake on greater business activity and wider employment of labor.

In spite of these hindering factors steel production, building contracts and engineering construction awards, and carloadings have improved during the past month.

While retail sales are having only a normal seasonal decline, their volume increase is not as great an improvement over last year's level as was anticipated; failure of retail prices to follow decline in commodity prices may be an explanation. Wholesale prices for all commodities reported by the U.S. Department of Labor for the month ending May 8 decline 0.68 per cent; those for farm products dropped 2.67 per cent and for food 1.63 per cent. The general weighted price index of the New York *Journal of Commerce* fell 1.31 per cent during the four weeks ending May 15. Grain price index slipped only 0.34 per cent and that for food is 1.00 per cent lower.

acreage of tomatoes this year. Intended 1937 acreage for this crop is 461,550 acres, compared to 477,100 acres planted in 1936 and 510,150 acres planted in 1935.

Canned Food Stocks Lower

STOCKS OF PRINCIPAL CANNED FOODS in the hands of canners and distributors, as reported by the United States Department of Commerce on May 1 (stocks as of April 1), were considerably lower than on the same date in 1936. For the year, canners' stocks of peas had decreased 53 per cent, corn had decreased 44 per cent, tomato stocks were down 29 per cent, green and waxed bean stock down 54 per cent. The stocks of these vegetables in distributors hands were practically the same as reported for 1936.

Stocks of canned peaches and pears, in the hands of both canners and distributors, were also about the same as in the same month of the previous year.

Packaged Candy Goes Better

SALES OF THE HIGHER PRICED CANDIES, consisting of chocolates and other confections put up in boxes, improved considerably according to a recent report of the Foodstuffs Division of the United States Department of Commerce. This report indicates that sales of this type of candy were 11 per cent higher in poundage and 13 per cent higher in value in 1936 than in 1935.

The report is based on returns from 308 manufacturers, who sold 131,000,000 lb. of packaged candy in 1936, exclusive of 5 and 10 cent items. This candy had a manufacturers' invoice value of $32,175,000.

Of the 1936 total, 117,025,000 lb., valued at $22,750,000, consisted of "plain package goods," that is, items packed to retail at less than $1 per pound; and 13,975,000 lb., valued at $9,425,000, consisted of "fancy package goods," retailing at $1 or more per pound. The average value per pound of the plain package goods was 19.4 cents, while the average value of the fancy pack was 67.4 cents per lb.

More Cocoa

CROP ESTIMATING has again gone haywire, if the mix-up concerning the size of the West African cocoa bean harvest is any indication. Last winter this crop was put at around 220,000 tons, and there appeared to be every prospect of a cocoa shortage developing before the next crop came around. Second guess on the matter shows, however, that the earlier estimates were far wide of the mark. Apparently, the total of this crop will be about 290,000 tons, the largest on record, comparing to the 1935-1936 crop of 285,507 tons, the previous record.

INDICATORS

RAINFALL in most of last year's drought area promises better things for the current crop season, except in parts of western Kansas and Nebraska, where the winter wheat is not receiving enough moisture.

FIG PRODUCTION in California is expected to increase this year, with an expected output of 24,000 tons compared to 20,000 in 1936.

MEAT IN COLD STORAGE still remains at high levels, with a total on May 1 of 971,965,000 lb., compared to 584,897,000 lb. on the same date in 1936, and a 1932-1936 average for the date of 732,305,000 lb.

LARD STOCKS are still high, the amount in storage on May 1 being 210,537,000 lb., which compares to a 1932–1936 average for May 1 of 109,368,000 lb.

EGGS IN STORAGE on May 1 were at a high point, totaling 6,938,000 cases. This figure compares to 2,929,000 cases on May 1 of 1936, and an average for 1932-1936 of 5,804,000 cases.

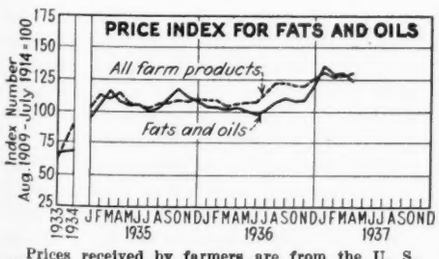
POULTRY in storage is also in ample supply, with a total of 94,947,000 lb. recorded on May 1, compared to 49,324,000 lb. on the same date last year, and a 1932-1936 average of 52,404,000 lb.

CHEESE, all varieties, in storage on May 1 totaled 83,093,000 lb., compared to 67,776,000 lb. on May 1, 1936, and a 1932-1936 average of 56,416,000 lb.

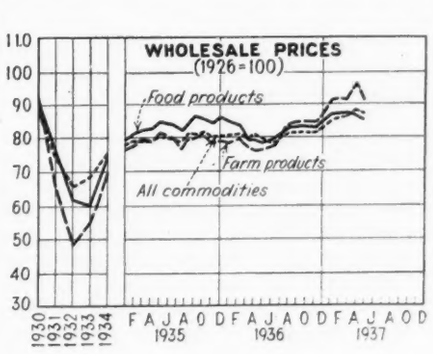
COFFEE deliveries from producing countries to the United States, ten months, July, 1936 to April 1937, have fallen off by 7.8 per cent, compared to deliveries for the same ten months of the preceding crop season.

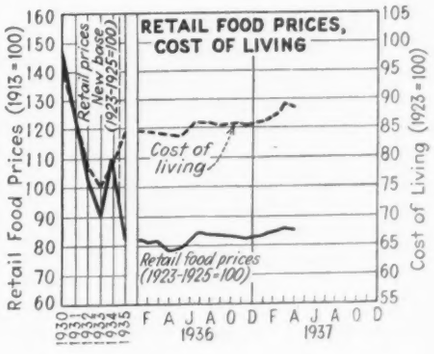
THE WEEKLY FOOD INDEX, compiled by Dun & Bradstreet, Inc., stood at $2.84 on May 11, which compares to a figure of $2.54 on the corresponding date of 1936, a gain of 11.8 per cent.

CARLOADINGS, in the first week of May, were 782,423 cars, a seven year peak for the week, and 16.6 per cent above the corresponding week of 1936.



Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *The Business Week*. The cost of living index is from the National Industrial Conference Board. Data on oils and fats are from the Bureau of Raw Materials for American Vegetable Oils and Fats Industries.




RETAIL FOOD PRICES, COST OF LIVING
Retail prices New Base (1923-1925=100)
Cost of living
Retail food prices (1923-1925=100)
Retail Food Prices (1913=100)
Cost of Living (1923=100)
1930 1931 1932 1933 1934 1935 1936 1937

Keeping Up WITH THE FIELD

Chain Tax Upheld—Tax Refunds Lost—Food Bill to Pass—Sugar Quotas Cause Battle—World Sugar Pact Signed—Price Bill Killed

High Court Hits Chains

ALREADY MOVING NATURALLY toward superstores and supermarkets, food merchandising got a decided boost in that direction by the chain-store decision of the Supreme Court on May 17. The most far-reaching ruling of its kind handed down by a high court in recent years, the decision on the Louisiana case permits a state to base a tax on stores not merely upon the number in the state but the number of units in one chain existing in the world. Thus, A & P, with 15,082 stores, comes in for the maximum levy of $550 a store in Louisiana, as would any other chain with more than 500 units. This is a tax which the traffic of the average chain store will hardly bear and continue a profitable business enterprise. In other words, if such a practice becomes prevalent among the states, "the era of the national chain is over," to quote A & P.

In presenting its defense, A & P pointed out the unfairness of the tax. There is another chain in Louisiana with 92 units. It pays $30 tax on each store. But A & P, with 106 outlets in the state, is charged $550 a store. The tax starts at $10 a store in a chain of not more than ten and progresses up through 15 gradations.*

A law similar to that in Louisiana, except that the tax is based on the number of stores in the state, had passed the legislature in Pennsylvania as FOOD INDUSTRIES went to press.

GETS NEW ASSIGNMENT

E. S. Stateler, Associate Editor of FOOD INDUSTRIES, will be located in Chicago after July 1 and will keep in contact with food manufacturing and processing operations in the Midwest. Mr. Stateler joined the staff of FOOD INDUSTRIES in 1930 after several years of experience in food chemistry, research and plant operation work, particularly in the baking and confectionery industries. The Chicago office of FOOD INDUSTRIES is located at 520 North Michigan Ave.

Tax Refunds Ruled Out

SOME 200 PROCESSING TAX CASES pending in the courts of the country were settled in one fell swoop when the Supreme Court upheld the government in a decision of May 17. In effect, the court refused to open the way for the recovery by processors of agricultural products of $963,000,000 of unconstitutional processing taxes collected under the invalidated AAA. The decision held that Anniston Manufacturing Co., Alabama textile firm, must prove that it had not passed the processing tax on to the buyers of its finished products or to the suppliers of its raw materials. This was in answer to the claim that since the processing taxes were unconstitutional, the funds collected should be returned. The court declined to rule on whether the company was entitled to recover the paid-in taxes, merely upholding the 1936 amendment to the Revenue Act requiring proof that the taxes had not been passed on. The company contended, and it is generally recognized in industry, that it is almost impossible to supply this proof so as to satisfy authorities.

Food Law to Pass

ALL HAS BEEN QUIET on the Congressional food and drug front during the past few weeks. But enactment of some form of food and drug legislation before the legislators end their present session is taken as a foregone conclusion by many who have been watching the machinations of the law-making machine in Washington. Public pressure is the prime mover of this machine. And the public wants the present law replaced by something which will more effectively prevent adulteration and other malpractices. The people apparently don't lose any sleep over control of the advertising provisions, the factor which has caused so much bickering among the Representatives.

When FOOD INDUSTRIES went to press, the subcommittees were about ready to report on their labors over the Copeland measure (S.5) and the Chapman bill (H.R.300). But about all that could be predicted concerning the final form of the legislation was that it would be such as to gain the approval of the White House. Then there was some indication that F&DA would withdraw from the fight for advertising control and let this authority go to FTC. This would avoid a repetition of the fate that overtook S.5 at the last session.

Several factors have interplayed to cause the delay in action on the food and drug legislation. Not least among these has been the friction between Senator Copeland and the White House. Then Representative Lea, who has taken over the reins of the food legislation in the House, has been loaded up with other duties. And further sand has been thrown into the gears by Mr. Lea's antagonism toward the F&DA and his advocacy of FTC. The attention of all Congressmen to the Supreme Court battle has, of course, been another retarding factor.

New Era Muddle

ANOTHER PIECE OF NEW ERA LEGISLATION has sunk in midstream and left manufacturers to swim to shore. The Miller-Tydings bill, which would have made price maintenance on trade-marked goods a national law, was sidetracked at the request of President Roosevelt early last month. And since then, industry has been in a dilemma.

It happens that 39 states have adopted fair-trade laws permitting manufacturers to set minimum prices, and a national fair-trade law is needed to make this system fully effective. As the situation stands now, a manufacturer in one state cannot issue price contracts in any other state with a fair-trade law

unless he incorporates in that state or unless he instructs his wholesaler to issue contracts for him. The former possibility is costly and the latter may be in violation of the Sherman Anti-trust Act. Most manufacturers desiring to set prices are doing it the safe way.

Coconut Oil Tax Valid

STARTING OFF A SERIES of important food industry rulings during the month, the Supreme Court on May 3 upheld the 3-cents-a-pound tax on domestic processing of Philippine coconut oil. This tax, which effectively protects the domestic fats and oils industries, constitutes a valid application of the government's taxing power, the judges held. Further, the government is conceded to have the right to set aside collections from the tax for the account of the Philippine treasury.

Congress imposed the 3-cent tax as part of the 1934 Revenue Act. At that time the AAA was in operation, and domestic fats were subject to processing taxes. Funds collected under the tax total over $40,000,000.

Haskins Bros. & Co. and Cincinnati Soap Co. carried the case to the high court, contending the tax was a regulatory measure outside the field of federal power and that it was in violation of the Tenth Amendment.

Mid-May

CAPITAL VIEWS

REGULATING MILK and the milk-products industry seems the latest fashion in Washington. Not only does the Federal Trade Commission suggest "a further inquiry" as to monopoly, but Senator Copeland thinks the Department of Agriculture needs new stimulus in its regulation. The distinguished food-and-drug Senator would have a coordinator take over all regulation of milk from the Bureau of Dairy Industry and the Public Health Service in order to stiffen quality control and otherwise benefit the public. Industrial milk users, as well as the milk-products industry, should expect

(*Turn to page 339*)

Farm Program Hits Skids

"WASHED UP" is the description Washington is giving of Secretary Wallace's pet farm program which collided head-on with the President's economy proposals. This is taken to mean that the plans for crop curtailment and other AAA activities are to be tossed into the political scrap-basket, for the time at least.

One of the major factors influencing this decision has been the high prices and the consequent flood of protest and complaint which has been rising rapidly in all sections of the country. This is making a serious impression on the minds of Administration chieftains.

Indices of Northern crops give no intimation of any plethora this fall. Indeed, most of the statistics indicate that planting, where it has been done, has been normal or very little in excess of normal.

That statement, however, is not true of the South. Preliminary estimates of the coming cotton crop run as high as a 16,000,000 bale harvest. Experts would not be surprised if the final figures are even higher than that, since, as one observer expressed it, "they are even using window boxes and flower beds for planting."

Wallace, and other Administration officials would like nothing better than to find a way of halting this development, but their hands are tied. The drastic steps of the past are no longer possible, or at least no longer politically expedient.

Sugar Bill Battle

PROPOSED SUGAR LEGISLATION has been turned into a political volley ball and is being batted about between the Administration, domestic producers and refiners and off-shore producers and refiners. And in the latter part of May, the game had gone into an overtime with the score tied. The Administration wants the sugar quotas to remain about as they have been, with domestic producers gaining no new favors. President Roosevelt, Secretary Wallace and Secretary Hull believe that further expansion of the domestic industry is uneconomic. The country, they reason, should continue buying from the off-shore producers, who in turn will buy other farm products from the United States. Domestic producers, principally the Florida and Louisiana cane growers, are fighting through their Representatives for a chance to expand production. Domestic refiners, of course, want as much sugar imported in the raw state as they can get, while Cuban refiners have diametrically opposite desires.

As FOOD INDUSTRIES went to press, the Committee on Agriculture had not taken action on the recommendations of its subcommittee, which made important modifications in the Administration's bill. The subcommittee increased the quotas of the continental cane and beet growers at the expense of the foreign quotas. This brought strong protests from the Administration, and indications point to a compromise between the Administration bill and subcommittee recommendations. Then, after the quotas are settled, there likely will be a battle in the House to make the processing tax ½ cent a pound instead of ¾ cent, as recommended by the Administration.

It is reported that the President threatens to veto any sugar legislation which increases domestic quotas appreciably, which would mean scrapping the quota system at the end of the year.

21 Nations Sign Sugar Pact

WORLD SUGAR PRICES are expected to be maintained, and perhaps increased somewhat, through the operation of a new international sugar agreement. This pact was signed by 21 leading sugar producing and consuming nations at the London conference on May 6. Intended to control world production and prevent glutting of the market with surplus sugar, the five-year agreement sets maximum exports for the open world market at 3,760,000 tons, which can be scaled down to 3,400,000 tons.

Quotas established for individual countries are as follows: Belgium, 20,000 metric tons; Brazil, 60,000; Cuba, 940,000; Czechoslovakia, 250,000; Germany, 120,000; Haiti, 32,500; Hungary, 40,000; Java, 1,050,000; Mozambique, 30,000; Peru, 330,000; Poland, 120,000; Santo Domingo, 400,000 and U.S.S.R., 230,000, excluding exports to Mongolia, Tanatuva and Sinkiang. The flexible provisions provide for reducing the quotas during the first two years by a maximum of 5 per cent.

The United States will continue to supply sugar for the free market in the same proportions as it does at present. And should United States legislation imposing quotas upon importations lapse before the agreement expires, it will be the policy of the country to maintain its tariff and full duty on sugar at a rate no higher than now existing. The Philippines will not export while the present arrangements with the United

CONVENTIONS

JUNE

1–3—Oyster Institute of North America and Oyster Growers' and Dealers' Association, New York.
1–3—American Society of Refrigerating Engineers', semi-annual meeting, French Lick Springs Hotel, French Lick, Ind.
7–11—Association of Operative Millers, with exhibit, Statler Hotel, Detroit.
28–30—National Macaroni Manufacturers' Association, Cleveland.

JULY

12–15—National Confectionery Salesmen's Association, Hotel Chelsea, Atlantic City, N. J.

States are effective, unless there is an increased demand in the open market. British restrictions, which set sugar production at a maximum of 569,000 tons of refined sugar, or 618,000 tons of raw, remain unchanged. British colonies will limit their total exports to the basic figure of 950,000 long tons. Australian exports are fixed at 400,000 tons and South African at 230,000 tons. India bans all overseas shipments except for exports to Burma. Canada did not sign the agreement, desiring to retain full freedom of action.

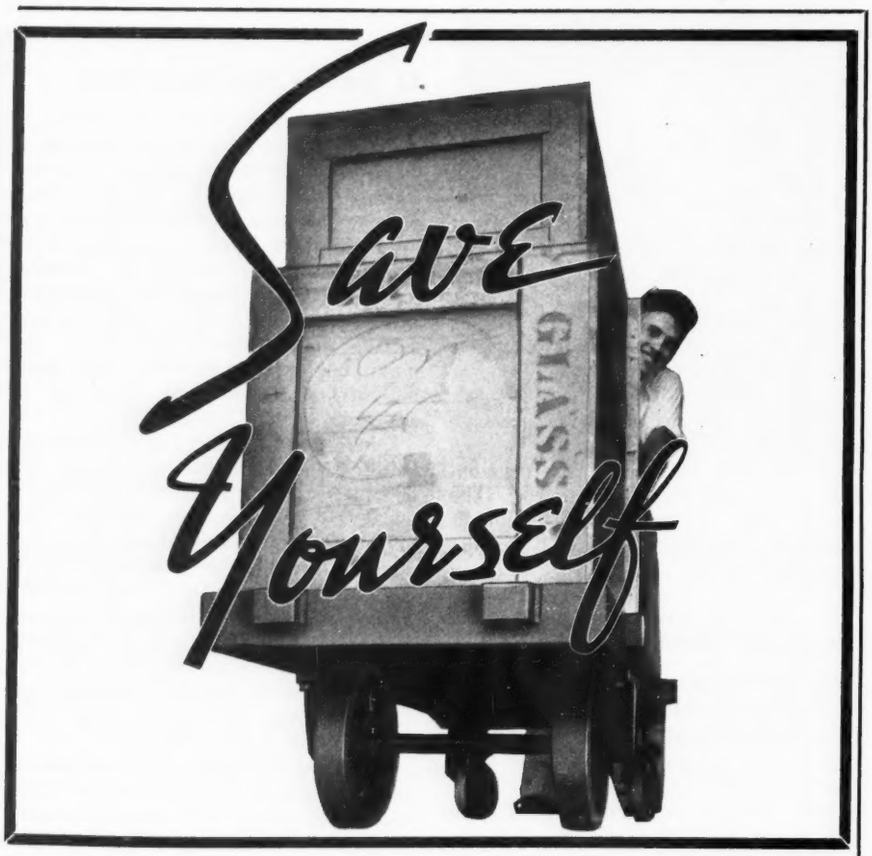
Labor Gets Concessions

AS THE STAR OF ORGANIZED LABOR continues its ascension, food manufacturers in many parts of the country and in many industries are being forced to bargain with union leaders. California canners, faced with the unhappy prospect of costly delay in a seasonal operation, recently came to terms with A F of L (FOOD INDUSTRIES, page 310). Borden Co., New York, signed an agreement with International Brotherhood of Teamsters on May 6 to end a year-old fight in which the union sought recognition. This agreement not only provided that sixteen men be reinstated with back pay totaling $26,000, but that the company cut off all financial support of Borden's Employes Cooperative Association, described as a company union. The agreement also called for an election to determine whether Borden employees wish to be represented by the International union.

United Fruit Co., threatened with a general tieup of its fleet as the crews of six ships walked ashore, agreed on May 6 to permit agents of National Maritime Union to board its ships and organize the crews.

Out in Kansas City, Mo., fourteen bakeries were inoperative early in May when organized workers struck. Kansas City Wholesale Bakers' Club demanded a $5 a week increase in pay and a 40-hour week.

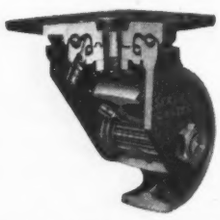
Hershey Chocolate Corp. had better luck than these other companies. Its employees rejected United Chocolate Workers of America as their bargaining agency, voting in favor of Loyal Workers' Club of Hershey.



● Save yourself some energy for play or recreation after the day's work. We're talking now to the man who puts his back into his job a couple of dozen times or more a day. The difference between Service Casters which swivel on ball bearings without calling for that *extra grunt*, and roll lightly on Timken or Hyatt bearings regardless of the load's weight — Just these differences between Service and other casters will leave you less tired at night.

Put it down in your book, or keep it in mind that the casters to buy for dollies or replacements on floor trucks in your department are "Service Casters."

And, we think your boss will Okay the idea for two reasons: You'll get work done faster, and he won't have so many casters to buy. Tell him about that crippled truck, or other spot where a new set of casters would save you a lot of sweating and swearing. Ask him to write us for the straight dope.



● This Service Caster is the Forge Weld and it's made of structural steel, drop-forged with top plate and king pin all in one piece. This one doesn't break under any circumstances. We haven't found out yet how long it takes to wear out.

SERVICE
CASTER & TRUCK CO.
525 BROWNSWOOD AVENUE, ALBION, MICH.

CONCENTRATES

• Under-cover complaints are reaching Washington to the effect that the Walsh-Healey law is not properly enforced, a situation said to result from an insufficient number of inspectors to cover all violations.

• *Senator Copeland has introduced a bill to merge the Bureau of Dairy industry and the milk sanitation division of the Public Health Service into a Bureau of Coordination of Milk and Milk Products under the Department of Agriculture. The measure would establish a coordinator to recommend regulatory legislation to State and Federal governments, to negotiate interstate agreements and to umpire trade conflicts.*

• A tax of three cents a pound would be levied on imported bread under a bill introduced by Representative McCormack . . . Repeal of the three-cent import duty on whale oil is sought by Senator Copeland in a bill introduced recently . . . Among recent fines levied by the Food & Drug Administration for violation of the pure food laws is $100 charged against a California shipper for packing ripe olives in second-hand arsenic barrels. The olives were contaminated with arsenic.

• *Exports of canned fruits slumped from 77,000,000 lb. in November and December of 1935 to 9,005,000 lb. for the same period of 1936 due to the effects of the maritime strike on the Pacific Coast. Exports of dried fruits dropped from 170,000,000 lb. to 24,000,000 lb.*

• Research on the use of honey in bakery products is being conducted by American Honey Institute. It is believed that honey will serve as an effective agent in delaying the drying out of cakes and cookies. Later, its uses in candy will be studied.

• *Mellon Institute, where considerable industrial research has been done on food*

problems, is now housed in a new building containing more than 6,000,000 cu. ft. of space. . . Standard dimensions and capacities for metal containers for canned fruits, vegetables and milk are provided for in a bill introduced recently by Representative Sauthoff.

• *Fluid vitamin D milks are now available in approximately 500 communities, and the consumption is estimated to exceed 3,000,000 quarts daily, about three-fourths of which is in the form of irradiated, evaporated milk, according to a report by State and Provincial Health Offices of North America.*

Capital Views

(*Continued from page 337*)

plenty more Washington attention, none of it in the direction of lower costs.

» PATMAN LAW—The Federal Trade Commission is going to have a lot of new money next year, of which nearly a half million dollars is earmarked for enforcement of the Robinson-Patman Act. Because there is no commotion just now, some have mistakenly thought that this law was being ignored. A series of test cases now in the courts will, it is expected, adjudicate many features of the law and decide how far FTC may go in enforcement. Wise executives are doing their best to observe the spirit of the law.

» RELIEF AND LABOR—There is a growing stream of complaints to Washington that relief methods prevent getting workers. This may prove very serious for seasonal employees needed by the food industries. The professionally unemployed will not take a job if they can help it, not if the relief distributor is looking.

» PRICE CUTTING—The President has told Congress that it should not pass the Miller-Tydings Bill, intended to eliminate price cutting on trademarked commodities. The President bases his opposition on the ground of "the present hazard of undue advance in prices." The truth of the matter is that the Chief Executive wants to boost prices of raw-materials to benefit farmer. miner, fisherman and forester. But he intends to use his power to the fullest in reducing prices to consumers. Processors and merchandisers, according to this theory, should be happy with no mark-up.

» "EXCISE" TAXES—The Administration has discovered that it can collect taxes on almost any processing operation and on almost any product if the form and the label of the legislation provides for an "excise" tax. As in the case of murder, it is difficult to prove motives. Hence, the tax collector cannot be kept out of industry's till when he is after such a tax, even though the effect may be to discipline an industry, to redistribute sugar quotas, to restrict meat imports or to make cooperation in agricultural control measures more certain. The technique changes, but the burden on industry's cost sheet is just the same.

» ECONOMY—It required a serious threat in the government bond market to persuade the President that official actions were unduly inflationary. He appears now fully persuaded. Economy is, therefore, fashionable. But the cuts will be made where they do the least political harm. And the aggregate of expenditures in the next fiscal year will exceed income substantially. We approach budget balance only if one says that slowly shrinking deficits represent "approach." The deficit shrinking is small this year and will be none too great next. New taxes to meet deficits represent the present Administration idea of economy.

A Star performer

Over 100 of our FA wrapping machines are now in use

In the short time since it was introduced, the Model FA type has become one of the most popular general purpose wrapping machines on the market. It has already been installed by over one hundred manufacturers, covering practically every industry in which packaged goods are produced.

Moderately priced. Compact in construction. Fast—wraps 60 to 75 packages per minute. Extremely flexible—may be quickly adjusted to wrap a wide range of sizes. Handles any type of wrapping material.

Using printed material in *roll form,* the FA offers large savings over the cost of cut-to-size sheets. With its Electric Eye registration, the machine locates the printing accurately on the package.

Manufacturers still employing hand wrapping or obsolete machines should, by all means, investigate the *facts* about the Model FA now! Because of the important savings this highly efficient machine makes possible, its price is often completely paid off within a few months after installation.

We shall be glad to show you one in your neighborhood.

Write for literature

PACKAGE MACHINERY COMPANY
SPRINGFIELD, MASS.

NEW YORK CHICAGO CLEVELAND LOS ANGELES
Mexico, D. F., Apartado 2303. Melbourne, Australia: Baker Perkins, Pty., Ltd. Peterborough, England: Baker Perkins, Ltd.

PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines

MEN, JOBS *and* COMPANIES

Industry

» ANGOSTURA - WUPPERMANN CORP., New York, recently offered for sale 100,000 shares of new common stock. The new capital is for advertising and for the development of new uses and markets for Angostura bitters.

» ARMOUR & Co. and Swift & Co. are planning a $40,000 expenditure in the construction of screening and pressing plants for the disposal of refuse from slaughter houses at Denver.

» ARMOUR & Co., Chicago, has called a stockholders' meeting for June 7 to act upon a refinancing plan. The plan involves the issue of not more than $75,000,000 in either convertible debentures or partly in such debentures and partly in first mortgage bonds. Proceeds would go for redemption of the 7 per cent guaranteed cumulative preferred stock of Armour & Co. of Delaware, a subsidiary, of which $54,162,800 is outstanding. Twenty million dollars would be used to refund on a longer basis bank loans of the parent company.

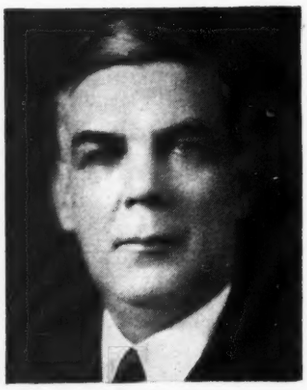
» BEECH-NUT PACKING Co. plans to construct a tomato products plant with floor space of 24,000 sq.ft. at Webster, N. Y. The company also will build a one-story packing plant at Fairport, N. Y., at a cost of $50,000.

» BRONTE CHAMPAGNE & WINES Co., operating at Detroit one of the largest wineries in the Midwest, has increased its production capacity to 400,000 gal. by addition of new equipment and larger facilities.

» J. B. CARR BISCUIT Co. will construct a four-story addition to its plant at Wilkes-Barre, Pa., at a cost of about $50,000.

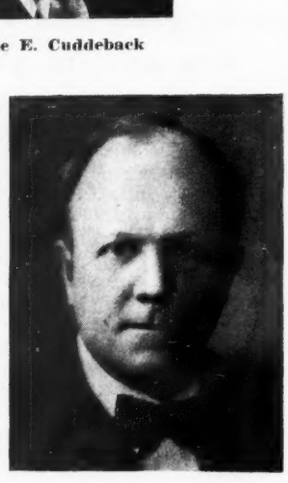
» COMSTOCK CANNING CORP., Newark, N. Y., has been formed as a successor to Comstock Canneries, Inc., and represents the consolidation of East Pembroke Canning Co., Egypt Canning Co., Finger Lakes Canning Co., Red Creek Canning Co., Rushville Preserving Co., Wayne County Canning Co. and Yates County Canning Co. The new company is second largest in New York. R. W. Comstock is president and S. K. Farrar, vice-president in charge of production.

» DAIRYLAND, INC., Shreveport, La., has taken over Metzger Dairies.



Clyde E. Beardslee

Christie E. Cuddeback



Charles A. Thayer

» FROST SEALED PRODUCTS, INC., is a new corporation joining the ranks of a rapidly expanding freezing industry in the Pacific Northwest. With headquarters at Tacoma, Wash., the company will process fruits and vegetables.

» H. J. HEINZ Co. will spend $250,000 to establish a plant at Hammond, La., it has been reported.

» JACKSON BREWING CORP., Detroit, will spend $45,600 to construct a two-story bottling plant.

» KRAFT-PHENIX CHEESE Co., LTD., has been incorporated at Victoria, B. C., as an extra-provincial company. The organization, which has a paid up capital of $1,000,000, will function as a sales and distribution unit.

» CARL MARTY & Co., Monroe, Wis., has purchased the Pet milk plant at Blanchardville, Wis., for the manufacture of powdered whey.

» NEUHOFF BROS. has put into operation its enlarged plant at Dallas. Improvements were made at a cost of about $140,000.

» NEW ENGLAND PRETZEL Co., Pawtucket, R. I., recently added a popcorn processing department, with J. E. Tebbetts in charge of production.

» WASHINGTON PACKERS, INC., will improve its Puyallup plant at a cost of about $75,000. Quick-freezing equipment capable of handling 2 tons per hour will be installed.

» WILSON & Co. plans to offer soon $6,500,000 of ten-year convertible debentures to increase its working capital and to finance an enlarged inventory.

Personnel

» CLYDE E. BEARDSLEE, general production manager of the manufactured products division of Borden Co., New York, has been elected a vice-president.

» RANDALL CAINE, formerly Western sales manager for Hills Bros. Co., New York, has been appointed general sales manager.

» CAROL CAMPBELL, for the last four years in charge of the production research laboratories of Cushman's Sons, Inc., has joined the bakery research department of Brown's Hungarian Corp., New York.

» W. J. COAD, JR., has been advanced to vice-president and treasurer of Omar Mills Co., Omaha.

» JAMES F. CRONIN recently became president of Association of Confectionery and Chocolate Manufacturers of the State of New York. He is with Fanny Farmer Candy Shops, Brooklyn.

» CHRISTIE E. CUDDEBACK, general sales manager of Sheffield Farms Co., New York, has been elected vice-president to succeed his father, Alva Cuddeback, who retired recently after 50 years in the dairy industry.

» OTIS E. DUNHAM, for fifteen years president of Page & Shaw, Inc., has gone back into the confectionery business as president of Dunham, Inc., Boston. Dunham will feature miniature chocolates, distributing on a wide scale.

» CHARLES G. GUTH, former president of Loft, Inc., Long Island City, New York, is selling 52,000 shares of stock in the company. This stock represents a controlling interest.

» JAMES M. HILLS has moved from president to chairman of the board of Grocery Store Products Co., New York, and is succeeded by Frank L. Cheek, who had been vice-president.

» F. W. HUNTZICKER, Greenwood, has been elected president of Wisconsin Cheese Producers' Cooperative.

» DOYLE E. HUTCHINSON, Mayfield, succeeds Martin L. Schmidt as head of Kentucky State Bottlers' Association.

» ROY INGALLS is the new manager of Washington Packers, Inc., Sumner, Wash. He recently was with the Hood River (Ore.) packing plant.

» R. C. ISENBRICK is now president of Pacific Canners' Association. He is connected with Campbell (Calif.) Packing Corp.

» C. J. JENSEN has sold the ice cream division of his dairy at Bellefontaine, Ohio, to Bell Center Creamery Co. He retains ownership of the butter division and will manage the enlarged ice cream plant.

» TURNER JONES has resigned as vice-president of Coca-Cola Co., Wilmington, Del., to become president of Coca-Cola Bottling Plant, Inc., Portland, Me.

» J. C. KEANE, since 1925 with the Bureau of Chemistry and Soils, has been appointed technical assistant to the general superintendent of Utah-Idaho Sugar Co., Salt Lake City.

» CHARLES W. MEEKINS recently became president of Manchester (N. H.) Dairy System, Inc.

» EARL L. MILLER, former vice-president and general sales manager of Shell Oil Co., has been made general manager of Golden State Co., Ltd., San Francisco. He succeeds Lowell H. Wilson, who has gone with General Milk Co., New York. Ferris Bagely was made production manager.

» JOSEPH E. MURPHY, formerly vice-president in charge of production at John J. Felin & Co., Philadelphia, has been elected president. John J. Felin, Jr., formerly assistant treasurer, has been made vice-president.

» H. E. OLSON has become treasurer of Albers Bros. Milling Co., Seattle, Wash. Mr. Olson has been with the company for ten years.

» W. M. PULFORD is now managing the Loose-Wiles Biscuit Co. plant at Enid, Okla.

» FRANK G. SMITH has been elected treasurer and a director of Atlas Malting Co., Bay City Mich., whose plant, when finished this month, reputedly will be the largest malting factory in the world.

» JESS B. SMITH is quitting as president of Millers' National Federation, as of June 1. His place is to be taken by O. D. Fisher, president of Fisher Flouring Mills Co., Seattle, who is chairman of the board of the association. Mr. Fisher, however, will not spend full time in association work, as did Mr. Smith.

Notice the even flow of sacks of flour from filling machines to stitcher over a Lamson Belt Conveyor in this nationally known flour mill.

MODERN production is a "straight line" process. But if there are "bottle necks" anywhere along the line—places where the steady flow of materials is retarded —the production schedule suffers.

Hundreds of food plants have eliminated these costly "bottle necks," or traffic jams by better routing with Lamson Conveyors.

Trained Lamson engineers are ready to help you solve *your* routing problems. They'll bring you a background of 50 years' experience. More, they have a thorough knowledge of—

ALL THE LATEST CONVEYORS

The complete Lamson line provides modern, dependable conveying equipment for every conceivable conveying problem. Write—ask for our engineer residing near you to call. Or mail the coupon for a free copy of our Conveyor Booklet.

LAMSON CONVEYORS

THE LAMSON COMPANY, Inc.
Syracuse, N. Y.

☐ Send me a FREE copy of your 24-page booklet on Lamson Conveyors.

☐ Have your engineer call.

Name.....

Address.....

» JAMES STOOPS, who spent 34 years in the canning industry, retired recently as president and general manager of Stoops Packing Co., Van Wert, Ohio. The position of general manager is now filled by A. Holmes Stoops, his son.

» NORMAN STAHLER has succeeded Leonard Tambyln as manager of Moores & Ross Co., Bellefontaine, Ohio. Mr. Stahler had been supervisor of retail delivery routes.

» CHARLES A. THAYER has been elected president of American Spice Trade Association, succeeding George M. Armor. He is with R. T. French Co., Rochester, N. Y.

» H. W. WHITE has been named executive in charge of ice cream manufacture for the Arkansas plants of Terry Dairy Co.

» J. EDMUND ZIEGLER has been elected president of George Ziegler Co., Milwaukee, succeeding his father, Frank P. Ziegler, now chairman of the board.

Would you pay
.001 CENT PER POUND
to kill this bug?

This is the Rice or Black Weevil which infests rice. These pests and their progeny cost the rice producers *plenty*. Investigation in one rice plant by our engineers disclosed the fact that it would cost .001 cent per pound for sufficient LIQUID HCN to obtain a *complete kill* in their bulk rice and .002 cent per pound in their packaged rice.

You may produce, or use, such products, as rice, flour, raisins, dates, figs, nuts, cocoanut and other foods which are subject to insect infestation. If so, write us for an estimate of the cost of obtaining a complete kill on the particular product you handle.

LIQUID HCN is an all-purpose pest destroyer. It is a powerful, concentrated, economical and efficient fumigant. Completely controls all insects which infest stored products, and kills rats and mice.

The American Cyanamid Company is the only manufacturer of HCN in all its modern forms — LIQUID HCN, ZYKLON DISCOIDS and CYANOGAS.

AMERICAN CYANAMID & CHEMICAL CORPORATION
Insecticide Department
30 ROCKEFELLER PLAZA, NEW YORK, N. Y.
KANSAS CITY MO. AZUSA, CALIF.

Deaths

» GEORGE ALBERS, 65, one of the founders of Albers Bros. Milling Co., Seattle, May 1.

» JOHN H. DOCKMAN, 90, president of John H. Dockman & Son, Inc., Baltimore, April 26. He founded the candy company more than 60 years ago.

» SAMUEL B. EPLER, 64, general superintendent of Page Dairy Co., Toledo, April 30. He had supervised the company for 23 years.

» WILLIAM E. FELIN, 45, president of John J. Felin & Co., Inc., Philadelphia, May 5. A son of the founder of the Felin company, he became president in 1929.

» EDWARD H. FIELMAN, 49, secretary of J. H. Fielman Dairy Co., Cincinnati, May 9.

» ROLAND D. FONTANA, president of Fontana Food Products Co., San Francisco, drowned recently in San Francisco Bay, apparently a suicide. He had been despondent since his brother, Mark E. Fontana, was killed in an airplane crash.

» CHARLES E. HEDRICK, 71, son of the founder of Hedrick Brewery, Albany, N. Y., May 5.

» LOUIS F. SWIFT, 75, former president and chairman of Swift & Co., Chicago, May 12. He was a son of the founder of the company.

Associated Industries

» CELLULOID CORP. has organized a technical sales and development division to give assistance to customers using Protectoid packaging materials.

» CLAPP & POLIAK, INC., is the new name of Roberts Everett Associates, Inc. Roberts Everett sold his interest in the firm.

» HORIX MANUFACTURING CO., Pittsburgh, has acquired the line of ice cream and cottage cheese filling machines formerly sold by Bergmann Packaging Machine Co.

» JOHNS-MANVILLE CORP., New York, has appointed Arthur S. Elsenbast vice-president.

» PATTERSON FOUNDRY & MACHINE Co. has opened an office in Pittsburgh.

» VIKING PUMP CO. has opened a branch office at Indianapolis. Clifford D. Sadler is in charge.

Continuous Frying

(*Continued from page* 305)

to cook their starch content. The inside of this cylinder is fitted with finlike paddles to keep the water and slices moving to the discharge end of the cylinder in a uniform manner. The starch, sugar and fibers are carried off in the overflow water. To date no expense-paying method has been perfected to recover these fermentable solids. They go to the waste dump as do the potato skins.

From this revolving cylinder washer the slices are delivered through a fresh water spray on to a 14-ft. rust-and-corrosion-resisting mesh conveyor which operates through a 45 deg. elevation and permits draining of the spray water and causes a matting down of the slices. At the upper end of this conveyor the slices fall through a 4-ft. drop to a lower mesh conveyor to be again separated into individual slices with the removal of additional surface water from the slices.

The delivery end of this short conveyor is fitted with a distributing device for spreading the partially dried slices in a uniform manner across the full width of a mesh feed conveyor which moves at a right angle and into the frying vat; specially shaped so that the frying fat is 4 in. deep at the feed end and 3 in. deep at the delivery end. Made of sheet steel, this 18 ft.x27 in. vat sits in a 24 ft.x4 ft. brick furnace which is oil-fired with four burners operating under a 2½-lb. per sq.in. feed pressure and set to maintain a maximum temperature of 440 deg. F. in the fat at the feed end and of 360 deg. F. finishing heat at the delivery end. Temperatures at both points are recorded on Brown recording instruments to serve as a guide for the regulation of feed of slices into and chips out of the vat at a rate which permits uniform temperatures to be maintained in the vat.

The mesh feed conveyor moves through the frying vat at a variable speed rate to correspond with the frying time required at the constant temperatures for slices of the seven different thicknesses. Puddling action of the finger-like projections, which operate in an off-center movement synchronized with the forward movement of the mesh conveyor, keeps the slices submerged in the hot fat and moving forward in a uniform manner with the conveyor.

As the chips emerge from the hot vat at the delivery end, excess fat drains off, leaving the chips crisp and relatively dry to pass through a regulated sprinkling of flaked salt.

The salted chips go immediately to the cooling and packing room which is separated from the cooking room by a glass and steel frame partition fitted with a swinging door for passage of workers and a triple-deck revolving delivery door for transferring chips and empty cooling containers to and from the cooling and packing room.

Air conditions in the cooling and packing room are kept at as near 40 per cent relative humidity and as free from strong currents of air as possible. These conditions are imposed for the purpose of keeping the chips crisp in texture and bright in appearance and with minimum contact with air during cooling and packaging operations in order that the development of staleness and rancidity may be retarded and the palatability of the chips extended over a long period of time. Separation of the cooling and packing room from the plant entrance, shipping room and can washing area along the other end of the building by a glass and steel frame partition helps to keep the air conditions in the cooling room as desired. The only passage through this partition is that closed by a sliding door and through which the mono-rail carrier transfers the packaged chips to the shipping room.

As soon as the chips have cooled to room temperature they are put in the packing table bins from which they are hand packaged into 1½, 3, 4, 6, 8, and 16-oz. bags and 3, 4, and 5-lb. tin cans for shipment. While all types of bags are used for packaging, the metal foil bag has been found helpful in retaining the crispness and palatability of freshly fried chips and is used particularly for distant markets. In local markets the turnover is so rapid that transparent cellulose, waxed sulphite, and waxed glassine are satisfactory.

In addition to the mechanical set-up there are two factors which make possible the production of a uniform, high quality chip by the continuous quick frying method. The simplest of these two factors is the manner in which the frying fat is kept free from objectionable flavor and color which would be taken up by the chips. For the volume of chips fried, a relatively small volume of fat is in the frying vat at any one time, which means that fresh oil—highly refined cottonseed oil—is added continuously to replace that taken up by the chips. In addition to this continuous feeding in of fresh oil, the frying vat is emptied at regular intervals and the used oil is run through a clarifying centrifuge and then blended on a small percentage basis with fresh oil before being returned to the frying vat. In this way an accumulation of charred bits of potatoes and starch is avoided.

THE OTHER FACTOR is the conditioning of the potatoes so that they will make good chips. While the Early Cobbler variety of potato is an excellent one for chips, the potato farmers will not keep their seed stocks limited to one variety. This means that the available supply of potatoes is a mixture of varieties running largely to Russets. Only U.S. No. 1 grade is contracted for. Deliveries begin in August to fill available storage capacity at the plant and continue as wanted until in April when all potatoes needed during the summer months are taken in.

The moisture content of the potato at time of slicing has an important bearing on the length of frying time, the amount of oil absorbed during frying, color of the chip, chemical deterioration of the fat under the influence of the frying heat, and the thickness at which the potatoes can be sliced without the formation of blisters on the surfaces and a horny rim on chips during frying.

To get the potatoes into the best condition possible for frying they are held at approximately 50 deg. F. storage until about six weeks before they are to be used. Taken from the cool storage they are subjected to the thermostatically controlled heat at 80 deg. F. for four weeks. Final treatment consists of drying and shrinking them still further under the influence of 90 deg. F. heat.

During these treatment periods the potatoes are handled in 60 lb. crates stacked 60 crates on each wheeled platform truck. This method of storing permits the air to circulate freely around through the potatoes and makes for a uniform loss of moisture. These storage and treating rooms are under the street floor of the plant and are equipped with a narrow gage rail system, similar to that used in mines, for moving the potatoes; and with a system of ducts and heating coils to assure equal distribution of heat and removal of moisture.

Saving through Safety

(*Continued from page 316*)

composition, may be obtained, using carborundum or some other suitable abrasive as a surface. These are far superior to the wood treads and, although higher in first cost, they actually are more economical because of their long life.

Stairways should be provided with substantial hand rails on both sides. Working platforms also should be provided with guard rails. And in addition, a toe board, at least six inches high, should be installed to eliminate the chance of material falling to the floor below.

Ladders cause many accidents in breweries. Men often use make-shift ladders. The only real solution here is to destroy this substandard equipment. Substantial ladders, constructed of a hard wood properly cured, should be provided. These should have non-slip safety feet, and if they are to be used around tanks or vats, the tops should be equipped with hooks. Where possible, a steel ladder should be securely bolted in position in preference to a portable ladder.

Conveyors are coming into more general use in the industry, and they bring new hazards that should be controlled. All conveyors, live or dead, should have cross-over steps at every aisle. Sideboards should be so extended as to prevent the jumping of cases or barrels at turns or on down grades. Low headroom underpasses should be clearly shown by contrast painting and warning signs. Material in case warehouses should be piled so that at least a two foot aisle is maintained on both sides of the conveyor. This will make it unnecessary for men to walk on top of it or to try to ride the belt to reach the other end of the aisle.

Bottle filling machines, cappers, and labelers seem to be the points at which bottles may explode. These machines should have mesh barriers installed that will protect the operator from flying glass. This may be difficult, but it is well worth the effort if injuries are prevented.

Pitching machines are now provided with interlocks that prevent the application of air to the tank unless the barrel is in position. Those that are not equipped can easily be protected with a "home made" interlock.

Particular care should be taken to provide sufficient artificial ventilation for men working in vats. Carbon dioxide gas may cause the suffocation of a workman cleaning a vat, while wood alcohol poisoning may cause permanent blindness to a man engaged in shellacing such a container. Positive feed air masks should always be supplied if natural ventilation is not obtainable. Gas masks should not be used where carbon dioxide is present in excess.

The air in the tanks should be tested before an employee is allowed to enter; and where tanks are being cleaned, even though the gas indication is negative, a life line should be supplied. This should be controlled by an outside man, who ought never to enter the tank while the other man is inside.

These physical hazards are but a few of the many that need attention if accidents are to be decreased. Some of the others are: Grounding of electrical equipment, maintenance of clear aisles, removal of protruding set screws on moving machinery, supplying barrel skids for trucks and providing gloves and goggles where caustic solutions are used.

Maybe The Cows are

CONTENTED

but don't think anybody else is!

While the world-renowned Queen Pieterje Hooghtraaten Carnation III (or something like that) drowses amongst the daisies, thousands toil to place her bounty before the babies of the world, put cream in sailors' coffee, *and do it at a profit.* And there can be no relaxing on this job, no ending to the search for better ways and better equipment.

And this attitude makes Carnation plants logical places in which to find Kemp heating equipment. Here, in the batteries of can-making machines, Kemp Melting (with gas) plays its small but dramatic part in that inspiring industrial opera, "Milkman to the World".

Would you consider your own heating equipment, cookers, ovens, roasters, "good enough" if you could find a better way, a quicker way, a less costly way? If *not,* you'll be interested in details. Address **The C. M. Kemp Mfg. Co., 405 East Oliver Street, Baltimore, Maryland.**

KEMP of BALTIMORE

Efficiency in Warehousing

(*Continued from page* 319)

moving flour from the warehouse into cars, trucks and boats. Outstanding is a telescoping carloader which simplifies and speeds the task of stacking bags in the car (Fig. 5). Other equipment used includes a portable car chute and a platform sling, in addition to the usual balloon sling for loading boats. Shipping by car now requires a crew of four instead of seven as needed with hand-truck system. This crew, which will load about 25 tons an hour, consists of a truck operator, a chute man, a checker and a loader.

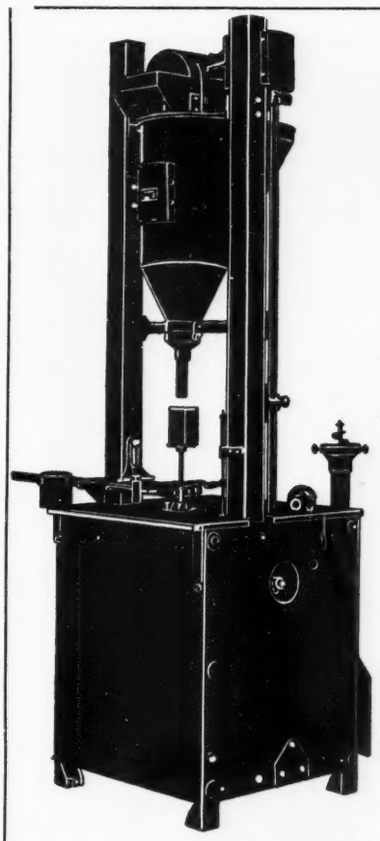
TO EXPLAIN THE ROLE played by the loading equipment in increasing warehousing efficiency, the shipping procedures had best be considered. When shipping by car from the first floor, the electric truck delivers the platform load directly into the car, running over a hinged steel ramp attached to the warehouse at each door. But when shipping by car from the second floor, the platform load is taken by truck to a chute opening, where it is left on rests. A warehouseman then removes the sacks one at a time and dumps them down the chute. At the end of the fixed chute, on the first floor, another chute is attached which can be extended into the car and raised or lowered by a block and tackle, which is a permanent fixture at each door. (See Fig. 6 for a diagram showing the flow of materials through warehouse.)

Having thus directed the sacks into the car by chute, the telescoping carloader comes into play for distributing the bags through the car. This carloader consists of four tables attached together and constructed so as to permit extending or telescoping. The top of the loader is polished, so that the flour bags slide easily along it. The practice is to put the loader inside the car and extend it so as to reach one end. Then as a sack of flour comes down the chute into the car, it slides onto the loader and strikes a curved backstop which directs it along the polished top to the end of the car. As the end is filled, the loader is telescoped, and finally whole loader is reversed in direction so as to fill the other half of the car.

When shipping by boat from the first floor, an electric truck delivers the platform load onto rests at the dock. From there the load can be dumped into a balloon sling and hoisted on board the ship in the customary manner. Or, if desired, a specially designed platform sling can be used. This sling has sides of heavy canvas which fit over the entire load in the manner of a tent. At the bottom of the "tent" are two steel channels, these being attached to the sling by vertical cables at the corners. The channels support the platform when the load is raised.

When shipping by boat from the second floor, a truck delivers the platform load to a chute opening. Then the sacks are dumped down the chute, falling onto a balloon sling.

That this system of handling materials in the warehouse has proven effective is demonstrated by the extent to which it has been applied. In the beginning, only a small amount of stock was assigned to platform storage, and but one electric truck was used. Now, all of the stock is stored on platforms, and nine trucks are in service.



S&S PACKAGING EQUIPMENT IS AND ALWAYS HAS BEEN THE CHOICE OF LEADERS

STOKES & SMITH Co

PACKAGING MACHINERY — PAPER BOX MACHINERY

4911 Summerdale Ave.,

PHILADELPHIA, U. S. A.

British Office: 23, Goswell Road, London, E. C. 1

FOR FILLING • SEALING • WRAPPING
15 TO 120 PACKAGES PER MINUTE

(*Continued from page* 315)

dation is most important in its deterioration as it also is in milk. Oily or tallowy off-flavors in milk and butter are brought about by factors not definitely established. It is a definite practice to produce good flavor in butter by the ripening and proper souring of the cream. And parallel with the better flavor there is better keeping quality.

Pasteurizing of cream prevents hydrolytic rancidity. Some anti-oxidants such as oat flour have been tried with partial success. Pre-clarification is a big help to inhibit oxidation. It is possible to mix in oat flour and filter afterwards. The best temperature for pasteurization is 83 deg. C. Most off-flavor is the result of contamination with metals; small amounts of copper and iron give decided off-flavors under certain circumstances, whereas in other samples of milk their presence does not seem to create an off-flavor.

Many substances eaten by cattle give distinctive flavors to the milk. Normal grass feed is a helpful factor and does not yield a likelihood of off-flavors. Carrots, tomato juice, lemon and orange juice make the milk immune to off-flavors. Homogenized milk does not produce oxidized flavors and certain micro-organisms may prevent development of off-flavor. Also, tin and aluminum reduce the potential and prevent oxidized flavors. Standing milk in the sun for 30 minutes in a bottle is likely to develop a considerable off-flavor. A stale, metallic flavor in strawberry ice cream is apparently due to contamination with copper. The amount of moisture in dried milk is important since too low moisture increases susceptibility to off-flavors.

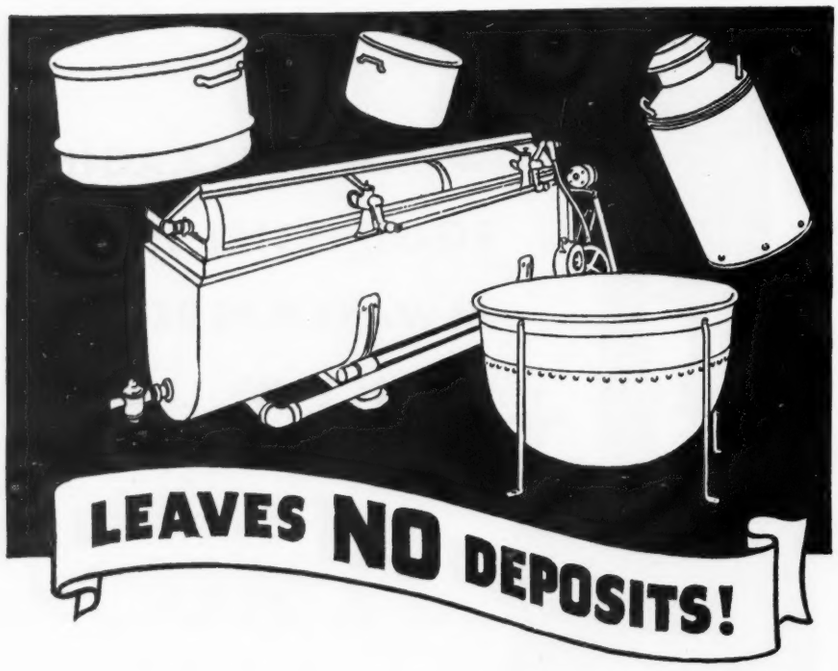
Trend in Beverage Flavors

Bernard H. Smith of the Virginia Dare Extract Company stated that the trend of the times is decidedly toward the production of better flavoring materials and that the general endeavor is to preserve the good original flavors of fruits. But it was his observation, that blending was necessary to produce a really good flavor, and today the necessity is to blend in order to preserve the flavor because natural substances do not long maintain their natural flavor.

Recovering Butter Flavor

M. E. Parker, Chairman of the Research Committee of the Association of Creamery Butter Manufacturers said that, in 1850, it was discovered that the so-called ripening of the cream changed the flavor of the butter. We now know that by establishing a pH of 4.3 by lactic fermentation, citrate fermentation can produce diacetyl from acetyl methyl carbinol. Diacetyl is present in good butter and, while it may not be the only dominant flavor, it is always associated with those substances which give a good flavor to butter. The best procedure is first to pasteurize the milk to eliminate undesirable enzymes and bacteria, then inoculate with the pure, ripening cultures. Nearly two-thirds of the desirable flavor is lost in the buttermilk. This may be recovered from the buttermilk by steam distillation and added back to the butter.

Because butter is a staple food it is quite as important to maintain the uniformity of the flavor as it is to produce a fine flavor.



Have you checked to SEE . . do you KNOW whether the chlorine sterilizing solution you use on processing equipment and utensils leaves a residue or white deposit? If it does, it is a sign that it does not rinse or drain away thoroughly and that there is a possibility of it affecting flavor and quality of your product

Avoid the uncertainty of this by using

OAKITE BACTERICIDE

IT LEAVES NO RESIDUE or WHITE DEPOSIT WHATSOEVER because it is completely and instantly soluble, gives a clear solution that rinses away COMPLETELY.

Due to its more active form of available chlorine, this amazing material goes about its bacteria destroying function immediately on contact with equipment. Dependable, economical, it provides daily assurance against contamination of product . . . safeguards quality.

Send for free booklet giving concise facts about OAKITE BACTERICIDE. Write for it today.

Manufactured only by
OAKITE PRODUCTS, INC., 26G Thames St., New York, N. Y.

OAKITE
TRADE MARK REG U.S. PAT. OFF.
SPECIALIZED INDUSTRIAL CLEANING MATERIALS & METHODS

freezing can be explained in the same way.

Digest from "Undesirable Color Change in Frozen Peas Stored at Insufficiently Low Temperatures." By Horace Campbell, *Food Research*, 2, 55, 1937.

FATS AND OILS

How Acid Earth Refining Affects Rancidity in Oils

IN A STUDY of the influence of refining with Japanese acid earth, activated clays, or active carbon on the rate at which vegetable, animal and fish oils and fats become rancid, it was found that these refining treatments tend to increase the rate at which rancidity develops. Coconut, rapeseed, linseed, peanut, Japanese walnut, soy bean, perilla, olive, castor, kapok, tung, whale, herring, sardine, dogfish, hake and pollack liver oils were used in the experiments, together with such animal fats as tallow, lard and horse fat.

Coconut oil was more stable than the vegetable drying oils and much more so than some of the fish oils. And when coconut oil did turn rancid the odor was much less disagreeable than in the more highly unsaturated oils which become rancid more rapidly. The accelerating effect of refining with acid earths or clays or with active carbon is distinct but not very great, as shown in the rancidity determinations. When the highly unsaturated oils, especially the fish oils, are hardened by hydrogenation, the rate at which the product becomes rancid is enormously decreased. In general, the accelerating effect of active carbon refining on rancidity is smaller than that of acid earth or activated clay refining.

Digest from "On the Influence of Japanese Acid Earth, Activated Acid Earth and Active Carbon Refining on Subsequent Rancidity in Oils and Fats," by Sei-ichi Ueno and Yukimi Hayasi, *Journal of the Society of Chemical Industry (Japan)* 40, 66, 70, 1937.

MISCELLANEOUS

New Way to Make Aerated Caramel Confections

AN IMPROVED PROCEDURE for making caramel products containing eggs has been developed to give a smooth, palatable confection by a mechanically efficient process. As disclosed in British Patent 456,266 (granted Jan. 28, 1937 to F. Sornet and A. Kopka, Chocolat-Magniez-Baussart), the essence of the invention resides in the manner in which the caramel and egg components are combined. The main batch is cooked to a sirupy consistency and a portion of it is added, while still hot, to the well mixed (not beaten) eggs. The remainder of the main batch is heated meanwhile to a temperature above the usual cooking temperature, e. g. to 284 deg. F. instead of 264 deg. F. The cooking is then stopped and the egg mixture is stirred well into the heated portion of the main batch.

Any desired flavoring material may be incorporated in the batch. This procedure gives thorough blending of the ingredients. For most products, egg yolk is preferred rather than whole egg. A slow speed beater may be used for mixing the eggs before incorporating them in the caramel batch, since they are not to be beaten. It is well to use a high speed beater for the final mixing operation.

Printed Wrappers Deodorized

REMOVAL OF OFFENSIVE ODORS from freshly printed labels or wrappers for candy, chewing gum, and other odor-absorbing foods may be accomplished in 48 hours by the method of treatment used by Beech-Nut Packing Co. When ordinary storage treatment is depended upon, several months, usually twelve or

VILTER
12 NOON
Use Your Compressor In The Off Peak Period To Make Your Own Ice
In the off peak hours your refrigeration equipment is relaxed and your compressor is dozing lazily, yet your investment burden goes on. You can, with surprisingly small additional investment, convert the "off-peak" expense into a profit by installing a Vilter Pakice Machine. Make your own ice for sausage making, top icing, bunker icing or cooling requirements, either in briquette or crystal form. Make as much or as little as you need, when you need it. Saves buying ice — saves crushing expense — saves waste — delivers more efficient protection. Requires little space and no extra labor.
PAKICE is working wonders for others — it will for you, too. Investigate.
THE VILTER MANUFACTURING COMPANY
2115 South First St.
MILWAUKEE, WISCONSIN
Representatives in Principal Cities
PAK-ICE

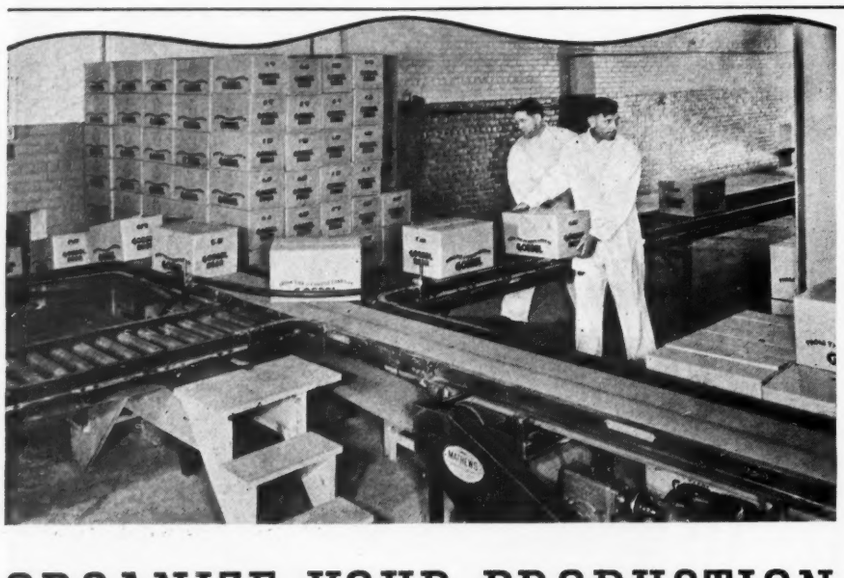
more, are necessary to free labels of ink odors.

As explained in U.S. Patent No. 2,075,533, the new method of treatment consists of subjecting the printed material to rapidly circulating heated air having a definitely controlled relative humidity.

The labels or wrappers are placed in the closed treating room so as to be easily reached by the circulating air. This current of air has a temperature of approximately 160 deg. F. and a relative humidity of between 70 and 80 per cent depending upon the moisture content desired in the labels or wrappers. The velocity of the air current may be as high as practicable. Ninety per cent of the air may be recirculated. The remaining 10 per cent is drawn in to keep a fresh air condition in the room.

Part of the offensive odors are claimed to be removed by volatilization and part by oxidation. Moisture content of air prevents drying out of label or wrappers with a resultant curling or wrinkling.

The patent was granted March 10, 1937, to Douglas M. McBean, Canajoharie, N. Y., and assigned to Beech-Nut Packing Co.



ORGANIZE YOUR PRODUCTION

for Continuous Flow

THE limits of technology are soon reached in practically every process in the food industries. If production is expanded only by adding equipment or space or workers, the reduction of costs which should follow increased volume is not obtained. What, then, can be done?

The answer is only to be found in the Continuous Flow Principle of Handling Materials—embodied in practical form in Mathews Conveyer Systems.

The past 30 years have proved that production in all industries can be revolutionized by applying this organizing principle; which is the only way to integrate many separate processes or operations into one efficient unitary process of production.

The Mathews Principle of Continuous Flow provides an absolute (instead of merely a relative) standard of efficiency for factory operation.

As applied by Mathews engineers, it eliminates congestion and bottle-neck, brings about the maximum overlapping or simultaneous performance of processes and speeds materials through the plant in minimum time, thus reducing inventories, improving quality and freshness and yielding maximum turnover and profit.

The first step is to ask for a survey by an experienced Mathews field engineer.

"Problems Solved with Mathews Conveyer Systems" is a book which illustrates many typical examples of the Continuous Flow Principle. Write for it today.

MATHEWS
CONVEYER COMPANY
116 Tenth Street
Ellwood City, Penna.

MATHEWS
CONTINUOUS FLOW PRINCIPLE OF HANDLING MATERIALS
CONVEYERS

DAIRY PRODUCTS

Rubber-Covered Cheese

USE OF WAX-RUBBER SHEETS for packaging cheese prevents formation of rind and growth of mold according to U.S. Patent No. 2,077,300.

This wrapping material is usable on both green and cured cheeses and permits the wrapping of the cheese at time of manufacture or after the curing stage when it is being cut up and packaged for marketing in small units. Its chief value lies in the use to which it may be put for packaging green cheese in units from ½ lb. up to 10-lb. blocks for pressing and curing without loss of moisture to form a rind, without deterioration because of mold growth, and without the necessity of cutting and repackaging for market after curing. Porosity of the material permits the escape of the CO_2 given off by cheese during curing.

Prior to pressing the wax-rubber coating may be protected against rupture by being covered with dry waxed crepe paper which also permits the escape of CO_2 gas without appreciable loss of water vapor and helps in pressing the wax-rubber film so close to the cheese that air layers and bubbles are forced out from between the film and the cheese. This outer wrapper may be left on or removed after the pressing operation. The wax-rubber film is easily removable when desired to prepare the cheese for eating purposes.

The cheese package so made is ready for marketing as soon as it comes from the curing room. When brand name or manufacturer identification is wanted the wax-rubber film may be marked or printed with suitable aniline or oil base inks. Also the cheese may be slipped into a carton such as commonly used for butter.

Patent covering this packaging method was granted April 13, 1937, to Allen Abrams and Charley L. Wagner, Wausau, and Benjamin F. Davis, Arena. Wis., as was U.S. Patent No. 2,077,301 covering the use of this wax-rubber material for the packaging of processed or emulsified cheeses. Both patents are assigned to Marathon Paper Mills Co., Rothschild, Wis.

Variations of Vitamin C in Milk

VITAMIN C IN MILK varies greatly from day to day, and between individual cows. Animals that are in the first month of lactation produce milk with about 10 per cent less vitamin C than in later months. The season of the year, the individuality and breed of the cow are also factors which cause variations.

Digest from "Variations in the Vitamin C Content of Milk," by Whitnah and Riddell. *Journal of Dairy Science*, 20, 9, 1937.

MEAT PRODUCTS

Poultry and Public Health

THE NEED FOR CLEANLINESS and sanitation in the production and distribution of poultry and eggs is illustrated by the fact that cases of human illness have sometimes been traced to use of diseased poultry or infected eggs. Healthy poultry and clean eggs carry no health hazards, but disease and filth must not be tolerated here any more than in any other type of food marketing.

Ducks are susceptible to enteritis and need more careful inspection for this disease than do chickens. Diseased birds are easy to detect and must be destroyed. Even their eggs may be infected. If sterilization of eggs is considered necessary, they may be dipped for only a short time in boiling 5 per cent soda solution, which causes no perceptible change inside the egg. Duck eggs should be used as fresh as possible. If they are stored, they must not be preserved with lime water.

It is not impossible for bacteria to penetrate through egg shells, but clean eggs of healthy fowl are safe because the white of a fresh egg has sufficient bactericidal power of its own to resist a moderate amount of bacterial penetration. This power is retained for perhaps three or four weeks. Infected eggs, while not permissible, are less dangerous in mayonnaise (because the acidity suppresses bacterial growth) than in creams and sweet products in which the organisms thrive. It is profitable for the producer to avoid infection by following the simple but necessary precautions of sanitation.

Digest from "Food Hazards from Poultry," by Martin Lerche, *Chemiker-Zeitung* 61, 118, 1937 (Published in Germany).

Stockton Cannery Strike

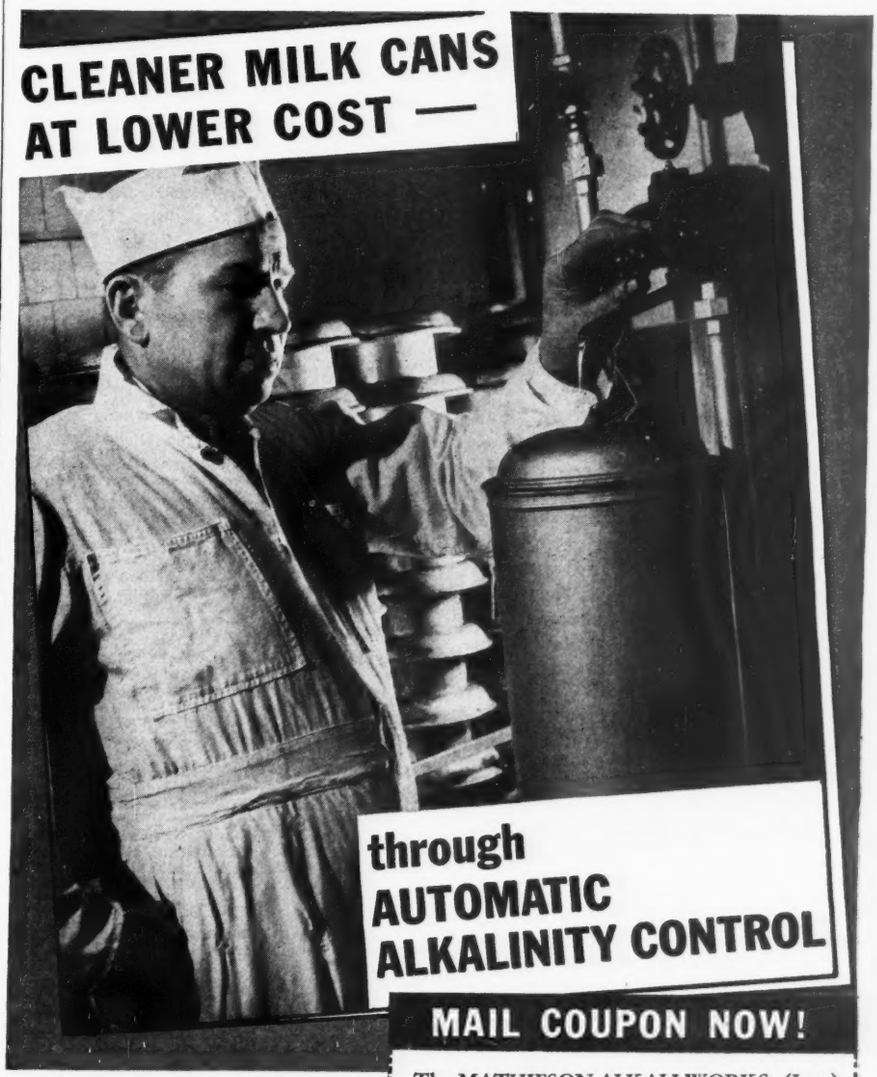
(*Continued from page* 311)

ton on Governor Frank Merriam became so great that the canneries were prevailed upon to reopen. Sufficient protection was promised. At the same time, 21 unions in Stockton wired William Green, A. F. of L. chief, to have Mahaffey thrown out and help them get rid of I.L.A. domination.

In the face of these moves the Bridges forces began a "strategic retreat" and the old-line union leaders were left in command.

The C.P.&G. approached the State Federation of Labor with the suggestion that the A.F. of L. organize the Stockton Cannery Workers' Union. An agreement was drawn up, on April 26, which provided that: (1) An election of officers and of negotiating representatives be held, supervised by the secretary of the State Federation, within five days after arrival of the union's charter. Employers were to furnish payroll lists of actual employees and only those whose names appeared on the lists were to vote. The election was to be by secret ballot. (2) The cannery workers' union was to select from its membership representatives to negotiate for wages, hours and working conditions assisted by the State Federation. (3) Negotiations were to begin the day the union's charter is installed and were to be completed within fifteen days. Any dispute arising out of the negotiations and upon which agreement could not be reached, was to be adjusted with the help of the State Federation.

The C.P.&G. feels it has weathered the Stockton storm reasonably well. If the new agreement works out, labor in the Stockton canneries and in other sections of the state as well, will be on a firmer and more orderly basis with the "outsiders" eliminated permanently.



HOW clean your milk cans are washed, how long they remain in service, how much you pay for cleanser—all depend upon how well you control the strength of the solution in your mechanical can washer. This bulletin describes an entirely new automatic alkalinity control that is simple, accurate and thoroughly practical. Send for your copy today and see how easy it is with the Lehmkuhl system to turn out cleaner milk cans at lower cost.

MAIL COUPON NOW!

The MATHIESON ALKALI WORKS, (Inc.)
60 East 42nd St., New York, N. Y.

Please send me a copy of your new bulletin, "Cleaner Milk Cans at Lower Cost".

Name .....

Company .....

Address .....

City ..... State .....

BOOKS RECEIVED

RETAIL PRICE CUTTING AND ITS CONTROL BY MANUFACTURERS. By Albert Haring, Assistant Professor of Economics, Lehigh University. Published by The Ronald Press Co., 15 East 26th St., New York, N. Y. 1935. 247 pp.; 6x8½ in.; cloth. Price, $3.50.

Causes of price cutting, advantages and disadvantages to retailers, and the resultant effect upon manufacturers and business in general are discussed in this book. Case examples, both real and hypothetical, in food, drug, and general merchandising fields are cited. Probable results of attempts to control price by legislation are discussed as well as are methods of eliminating price cutting by the manufacturer without legislative aid.

BEHIND THE SCENES OF BUSINESS. REVISED EDITION. By Roy A. Foulke. Published by Dun & Bradstreet, Inc., 290 Broadway, New York, N. Y. 1936. 200 pp., 7x10 in.; board; illustrated.

Balance sheet and operating ratios on 54 lines of business are covered in this study of present-day business enterprises. The study was first published in 1935 for the purpose of giving business men a background of facts and interpretations on business operations not heretofore readily available. The several chapters were originally published as separate studies in various numbers of the *Dun & Bradstreet Monthly Review* but have been revised and enlarged to include additional lines of business activity for which exact information had not previously been available.

Among the food industries included in this study are confectionery making, fruit and vegetable canning, and butter, egg, cheese, groceries, and fresh fruit and vegetable wholesaling.

The chapters cover such subjects as: (1) Prosperity of the Business Enterprise, (2) Capital Ratios, (3) Inventory Ratios, (4) Sales Ratios, (5) Net Profit Ratios, (6) Relativity of Business Conditions, and (7) Ratios of the Wholesale Grocery Trade.

107 PRACTICAL METHODS OF MINIMIZING PAYROLL TAXES. By A. H. Berger. Published by Tax Consultants of America, Inc., 70 West 40th St., New York, N. Y. 1936. 159 pp.; cloth; illustrated. Price $3.

Every taxpayer, whether individual or corporate, is entitled to understand and to apply intelligently the provisions of tax laws to keep his taxes to their lowest legal figure.

In the instance of payroll taxes, the cost burden for social and economic security is placed largely upon the employer and to a lesser extent upon the employee by recent legislation. While this burden is federal in its origin it is being added to by state legislation and like previous tax burdens it is very probably heavier than necessary because of confused understanding of the requirements of the Social Security legislation.

From his sixteen years of experience as a certified public accountant and adviser in the solution of tax problems, the author has prepared the contents of this book to help employers and business concerns keep their payroll taxes to the lowest legal limit.

Of the five chapters in the book one is devoted to practical methods by which payroll taxes can be kept to their lowest level. Another one reviews and illustrates the various accounting records and forms required by the Treasury Department of the Federal Government. A survey of the various state laws supplementing the Federal Social Security Act is also included.

PATENTS

Bread Baked in Pans Fitted Into a Sheet Metal Frame Resting on Oven Hearth Which Permits Movement of Pan Bottoms to Points Below and Above Level of the Bottom of Frame—Paul S. Ward, Cincinnati, Ohio. Part interest to George E. Stebbins, Edgewood, Pa., and Ashley F. Ward, Rebecca A. Ward, Blanche F. Ward, Helen E. Ward, Ashley F. Ward, Jr. and John A. Ward Cincinnati, Ohio. No. 2,073,892. March 16, 1937.

Macaroni Products Containing 95 per cent Wheat Product Made With a pH of 7.0 to 10.0 Obtained by Use of 0.08 to 0.56 per cent of Calcium—Olaf F. Rask, Baltimore, Md. One-half to Herbert C. Fooks, Baltimore, Md. No. 2,074,064. March 16, 1937.

Short-cut Macaroni Products and Egg Noodles, Dried in a Continuous Manner by Passing Through Compartmented Drying Chamber in Still Air and Circulating Air Zones on Mesh Screen Belt Conveyor—Nicholas J. Cavagnaro, Richmond Hill, N. Y. to Consolidated Macaroni Machinery Corp., Brooklyn, N. Y. No. 2,074,458. March 23, 1937.

Fruit Slices Dried by Passing Through Absorbent Surfaced Rolls—Frank W. Cutler, and Aza B. Cutler, Portland, Ore., to Food Machinery Corp., San Jose, Calif. No. 2,074,740. March 23, 1937.

Bake Ovens Heated by a Portable Oil Burner—Louis P. Faucher, North Grosvenor Dale, Conn. No. 2,074,744. March 23, 1937.

Pretzels Twisted by Mechanical Means—George H. Hartman and John S. Burden, Cleveland, Ohio. No. 2,074,904. March 23, 1937.

Biscuits Fed From Cutting Machine Conveyors to a Plurality of Ovens—George Ralph Baker, Willesden, London, England, to Baker-Perkins Company, Inc., Saginaw, Mich. No. 2,075,012. March 30, 1937.

Molasses Clarified by Addition of 1 to 3 Parts by Weight of Water, and From 0.1 to 1.5 Per Cent of Pyrophosphoric Acid or Soluble Salts, With Heating to 90-100 Deg. C. With the Formation of a Precipitate—Morris W. Mead, Jr., Bloomfield, N. J. to National Grain Yeast Corp., Belleville, N. J. No. 2,075,127. March 30, 1937.

Mechanical Means of Breaking and Separating Eggs—Rolland L. Cleveland, Springfield, Mo. No. 2,075,270. March 30, 1937.

Labels For Food Products De-odorized by Circulation of Air Through Room Held at Approximately 160 Deg. F. With a Relative Humidity Corresponding to Moisture Desired in the Finished Label—Douglas M. McBean to Beech-Nut Packing Co., Canajoharie, N. Y. No. 2,075,533. March 30, 1937.

Oils and Fats of Organic Origin Stabilized Against Rancidity Through the Addition of Phosphoric Acid Ester of Polyhydroxy Compounds—Albert K. Epstein and Benjamin R. Harris, Chicago, Ill., No. 2,075,806. April 6, 1937.

Oils and Fats of Organic Origin Containing Oxidation Catalysts of Heavy Metals, Stabilized Against Rancidity by Ester of Glycerin and Phosphoric Acid—Albert K. Epstein and Benjamin R. Harris, Chicago, Ill. No. 2,075,807. April 6, 1937.

Jelly-Making Mixture Made From Dry Pectin, Sugar, Acid and a Non-Effervescent Buffer Salt—Albert S. Leo, Ontario, Calif. to California Fruit Growers Exchange, Los Angeles, Calif. No. 2,076,036. April 6, 1937.

Chewing Gum Base Made From Rubber and a Resinous Material to Regulate Hardness of Chewing Gum—John O. Barker, to Sweets Laboratories, Inc., New York, N. Y. No. 2,076,112. April 6, 1937.

Pies Wrapped by Mechanical Means—Andrew Bodor, Newark, N. J. to Harry Frederick Wanvig, Garden City, N. Y. No. 2,076,291. April 6, 1937.

Means for Making Molded Frozen Confections—Ludwig Loewenstein, Chicago, Ill. No. 2,076,377. April 6, 1937.

Acid Whey Solution at pH 4.3 Passed Through Electrolytic Cell for the Precipitation of Therapeutic Mixture of Calcium and Phosphorus Salts—Forest H. Clickner to Kraft-Phenix Cheese Corp., Chicago, Ill. No. 2,076,400. April 6, 1937.

Citrus Fruit Juices Deaerated and Handled Under Vacuum Prior to Breaking Vacuum and Running Into Cans Under Nitrogen Gas Pressure Preparatory to Vacuum Sealing of Cans—James Hanson, Sunnyvale, Calif. to Libby-McNeill & Libby, Chicago, Ill. No. 2,076,459. April 6, 1937.

Tomatoes Cored and Peeled by Mechanical Means Similar to That Used for Apples—Charles F. Deitz to Victor N. Adams, Miami, Fla. No. 2,076,496. April 6, 1937.

Fat, Cheese, Flavoring Materials, and Special Mixtures Worked Into Bakery Doughs by Mechanical Lapping and Overlapping of Sheet Dough as it Moves Across a Conveyor—Kenneth D. Loose, Bronxville, N. Y., and Charles W. Watkins and Joseph W. Green, Dayton, Ohio, to Loose-Wiles Biscuit Co., Long Island City, N. Y. No. 2,076,657. April 13, 1937.

Vitamin A Content of Fish Livers Recovered From the Alcoholic Saponifying Mixture by Extraction With Equal Part of a Lipoid Solvent Immiscible With Water—Fritz Laquer, Wuppertal-Vohwinkel and Paul von Dobeneck, Wuppertal-Elberfeld, Germany, to Winthrop Chemical Co., Inc., New York, N. Y. No. 2,076,901. April 13, 1937.

Green Cheese Pressed and Cured After Packaging in a Wrapping Sheet Made of a Wax-Rubber Composition—Allen Abrams and Charley L. Wagner, Wausau, and Benjamin F. Davis, Arena, Wis., to Marathon Paper Mills Co., Rothschild, Wis. No. 2,077,300. April 13, 1937.

Processed Cheese Packaged in a Wax-Rubber Wrapping Film—Allen Abrams and Charley L. Wagner, Wausau and Benjamin F. Davis, Arena, Wis., to Marathon Paper Mills Co., Rothschild, Wis. No. 2,077,301. April 13, 1937.

Doughnut-Making Machine Equipped With Means for Circulating Air to Carry Away Cooking Fumes and to Cool Doughnut-Forming Mechanism and the Dough—George L. Chapel, Grand Rapids, Mich. No. 2,077,395. April 20, 1937.

Citrus Fruit Feed of Green Color by Treatment With Chlorophyll—Reducing Agent Which May be Absorbed by the Waxes or Oils of the Peel or by Immersing in Soap Solution Containing the Active Agent—Rodney B. Harvey, St. Paul, Minn. No. 2,077,411. April 20, 1937.

FOOD INDUSTRIES

1937 FACT PICTURE

(Based on the 1935 Census of Manufacturers which has just been released)

Food Production	**352**
Food Imports and Exports	**355**
Food and Employment	**356**
Food Merchandising	**358**
Food Prices	**360**
Food Consumption	**362**
Trends Affecting Food	**364**
Food Industries Balance Sheet	**365**
Food and Population	**366**

»Figures Are Interesting

No FIGURES are more fascinating to a baseball fan than the tables of big league batting averages. No figtures receive more careful scrutiny than the stock market quotations by a man who owns, or thinks he owns, some securities. Sometimes a man gets quite a kick out of nothing more than mulling over his choicest telephone numbers. And sometimes men have dropped dead over a large table of figures, which to others looked as dry as dust. It all depends on how much background you bring to the figures.

To those whose business interests are affected by the national economic picture all industrial statistics have a vital fascination. Naturally the statistics mean most to the man whose job gives him access to his company's own statistics, for then he can learn what part of the available business his company was able to capture. To learn the national trends and to make sound plans and forecasts he must start from accurate figures of the state of food business. Such figures are made available every alternate year by the Census of Manufactures. And these statistics are all that will be available for approximately another two years when the 1937 Census figures will be made available.

Men in subordinate jobs should also study and understand the statistics which follow, for trends in their branch of industry have an important bearing on the future of the individual. Alert men try to work out a career in promising industries. Any man who ever dreams of getting to the top should begin to ask himself "what do such figures mean to me—to my business?" Men at the top have to do a lot of this.

»Don't Miss The Big Picture

OUT OF THE PAGES THAT FOLLOW, each will draw conclusions that apply to his own individual enterprise. There is, however, a bigger picture—so big that it may easily escape one's attention. Food manufacture represents roughly 20 per cent of all manufacturing activity, whether one measures it by number of establishments, number of persons employed, value of the raw materials used or the value of the products produced. The food industries are very large and very stable.

Of all the gainful employment in the United States, roughly one-quarter arises from the big job of feeding the nation. This includes the crop production, manufacture and transportation or other service activities in this essential task. It was not always this way. There was once a time when nearly everybody had to take part in the raising or production of the food for the population.

Regardless of the Washington definition of what is or is not a manufacturing industry, a commonsense view should prevail here but available statistics do not permit. Washington does not regard a dairy as a manufacturing establishment in spite of all the processing equipment it employs. Nor does it regard as manufacturing such a series of processing operations as ethylene gas treatment, washing, drying, waxing, polishing, wrapping, packing, and refrigerating which are often employed in getting an orange ready for the market. So in this Fact Picture we are limited to including everything that goes through a factory, according to the official definition.

»How Other Foods Affect Your Business

ALL FOODS are intercompetitive and interrelated, not only by reason of similar manufacturing methods but by reason of the effort each manufacturer has to make to get his goods on the consumer's dinner table. To illustrate: bread consumption for example on a per capita basis is slowly declining. Other foods are increasing in consumption. What are they and what can millers and bakers do about it?

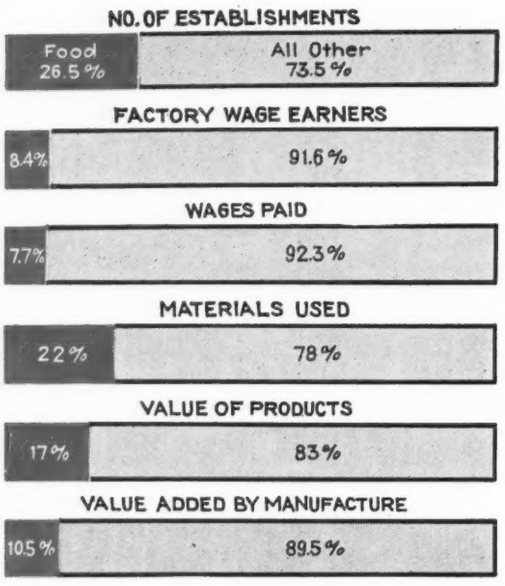
Cured meats, pork, eggs, poultry and fish are in vicious competition. Producers and manufacturers of commodities cannot escape this intercommodity competition—though some may try to ignore it.

This 1937 Fact Picture of the Food Field, two years in compilation, is condensed from the voluminous data just released by Washington. It will serve as a convenient starting point for further detailed studies where they may be necessary.

FOOD PRODUCTION

Preliminary data from the 1935 Census of Manufactures

The Part Food Plays in United States Manufacturing Industry.



IN SPITE OF THE TIME which has elapsed since the date on which the 1935 Census of Manufactures was made, only preliminary reports were available at the time that FOOD INDUSTRIES compiled the information on this and the two succeeding pages. When the final printed report of 1935 Census is issued, some of the figures given here may be revised. However, it is extremely unlikely that any such changes will be great enough to detract from the practical utility of these figures for any purposes except those of the most exacting statistician. Data given are sufficiently accurate to show the relative standing of the various branches of the food industries.

The bar chart given on this page is based on data compiled by FOOD INDUSTRIES from the 1933 Census of Manufactures. While some change in the percentages shown has undoubtedly occurred since that time, later data are not yet available in form complete enough to place on this chart.

Distribution of The Food Industries by States.

PRODUCTION OF FOOD, 1935

Source: U. S. Census of Manufacturers

(Preliminary Figures—Subject to Revision)

Industry * Main and Sub-Classification	Number of Establishments†	Cost of Materials ‡‡	Wages Paid ‡	Value Added by Manufacture △	Value of Products §		
					1929	1933	1935
Bakery Products							
Biscuits and Crackers	348	$89,312,527	$25,887,811	$93,295,969	$274,489,531	$149,445,158	$182,608,496
Bread and Other Products	18,720	580,395,669	222,644,564	472,068,735	1,251,621,280	770,332,374	1,052,464,404
Beverages **							
Non-Alcoholic	3,175	62,065,399	17,343,439	97,232,198	270,323,803	111,297,233	159,297,597
Malt, Alcoholic	666	139,808,688	60,614,924	280,221,452	.....	229,960,526	420,030,140
Vinous	315	15,307,326	2,106,950	21,432,332	.....	24,083,858	36,432,332
Distilled, Alcoholic	131	76,486,726	8,360,820	76,388,182	.....	35,489,774	152,874,908
Rectified and Blended Liquors	260	56,715,625	4,527,214	42,414,166	.....	.....	99,129,791
Canned and Preserved Foods							
Canned and Processed Fruits and Vegetables	2,744	409,145,771	70,612,276	240,498,261	750,342,041	439,988,206	649,644,032
Fish and Sea Food, Canned and Preserved	274	39,192,279	6,309,833	21,396,129	42,351,747	40,559,806	60,588,408
Confectionery and Chocolate Products							
Chewing Gum	26	14,985,333	2,416,923	32,780,847	60,160,126	41,654,480	47,766,180
Chocolate and Cocoa Products	44	66,407,459	7,995,804	26,639,368	119,540,693	67,754,144	93,046,827
Confectionery	1,314	153,691,598	39,251,753	106,197,702	393,269,849	211,833,211	259,889,300
Dairy Products							
Butter	3,458	423,006,516	17,516,071	78,209,088	700,867,648	384,951,858	501,215,604
Cheese	2,573	84,110,002	3,935,786	14,839,721	112,633,303	56,968,562	98,949,723
Condensed and Evaporated Milk	467	130,945,071	8,318,938	40,544,270	207,494,284	131,086,300	171,489,341
Ice Cream	2,447	101,167,603	19,104,483	108,517,007	328,413,911	158,386,304	209,684,610
Flavoring Extracts and Flavoring Syrups	407	29,185,230	2,651,066	38,689,705	.....	54,168,946	67,874,935
Grain Products							
Cereal Preparations (Breakfast food, prepared flour, coffee substitutes)	110	82,433,215	8,525,581	64,247,823	175,223,126	111,025,686	146,681,038
Corn Products	36	70,263,175	8,435,896	33,368,576	165,983,739	93,360,979	103,631,751
Feeds, Prepared, Animal and Fowl	942	230,588,413	11,068,152	58,071,391	402,752,534	161,343,173	288,661,804
Flour and Other Grain Mill Products	2,193	716,211,753	27,104,722	137,007,308	1,060,269,418	567,003,086	853,219,061
Macaroni and Related Products	336	31,799,997	5,306,226	15,798,551	47,074,230	35,891,909	47,598,554
Malt	54	56,411,961	2,348,008	18,706,373	23,602,938	27,922,786	75,118,334
Rice, Cleaning and Polishing	68	34,214,400	1,312,421	9,899,013	48,793,777	30,683,380	44,113,413
Ice, Manufactured	3,595	28,020,591	20,634,559	100,364,866	210,952,264	139,263,119	128,385,457
Meat and Meat Products							
Meat Packing Products	1,223	2,030,004,273	136,467,687	332,364,808	3,434,654,098	1,490,085,488	2,362,369,081
Poultry, Cleaning, Dressing and Packing	562	76,640,622	5,068,241	16,303,416	130,161,230	66,156,977	92,944,038
Sausage and Related Products	808	103,391,633	10,088,807	26,903,293	108,246,194	86,438,092	130,094,926
Oils and Fats							
Oleomargarine, and other Butter Substitutes	14	23,292,842	1,302,954	9,109,384	46,521,823	12,765,620	32,402,226
Shortenings (other than lard) and Oils	48	177,920,994	4,708,783	34,768,017	154,553,197	85,929,574	212,689,011
Sugar							
Beet Sugar	77	71,142,464	9,338,427	24,017,340	108,552,581	127,133,272	95,159,804
Cane Sugar	74	18,297,882	1,530,460	7,982,732	18,325,792	18,233,202	26,280,614
Cane Sugar Refining	18	336,176,671	13,913,501	41,037,771	507,389,262	337,075,225	377,214,442
Vinegar and Cider	125	4,758,548	1,000,945	3,759,532	10,450,332	6,630,508	8,518,080
Food Products, Miscellaneous	1,029	158,422,024	12,126,455	64,184,338	171,860,987	152,753,626	222,606,362
Totals	48,681	$6,721,920,280	$799,881,481	$2,788,754,344	$11,606,368,135	$6,604,036,429	$9,510,674,624

* Industry groupings are those used in the 1935 Census of Manufactures.
** Figures not comparable to those of preceding censuses.
† The Census of Manufactures does not enumerate or consider plants with less than $5,000 annual value of product in the census year.
‡ Does not include salaries of officers and salaried employees.
‡‡ Cost of materials, containers, fuel and purchased electric energy.
§ Value given is value of f.o.b., factory prices, and includes non-food by-products.
△ This value is obtained by subtracting value given as cost of materials from that given as total value of products.

FOOD PRODUCTION BY STATES

Data Sources: Census of Manufactures

(1935 Data is preliminary—Subject to revision)

	1935			1933			1931			1929		
	Number of Establishments	Wage Earners* (Average for the year)	Value of Products	Number of Establishments	Wage Earners* (Average for the year)	Value of Products	Number of Establishments	Wage Earners* (Average for the year)	Value of Products	Number of Establishments	Wage Earners* (Average for the year)	Value of Products
United States — Total	48,681	797,442	$9,510,674,624	40,285	666,237	$6,604,036,429	47,767	635,359	$7,958,361,779	55,277	737,931	$11,606,368,135
Alabama	370	4,074	32,384,022	321	3,127	20,952,732	385	3,414	25,686,288	517	4,416	30,754,029
Arizona	130	1,275	13,403,802	111	981	9,159,141	135	1,070	12,259,227	160	1,361	17,693,357
Arkansas	388	4,041	28,051,257	313	3,281	19,209,041	399	3,063	21,858,318	557	4,042	46,419,849
California	3,366	74,205	761,559,590	2,715	60,824	557,391,795	2,948	52,292	596,312,253	3,428	64,169	814,572,605
Colorado	489	8,290	96,000,969	435	7,554	76,130,566	511	7,498	89,899,125	573	8,766	133,845,859
Connecticut	612	6,037	48,012,333	488	4,870	32,981,569	552	4,272	35,536,278	600	4,603	44,459,423
Delaware	128	2,742	17,145,859	131	2,163	10,969,573	148	2,141	15,266,009	177	2,632	20,634,143
District of Columbia	157	2,838	24,682,764	121	2,672	19,709,726	154	2,716	24,550,325	178	2,597	28,632,326
Florida	596	8,708	49,194,052	472	5,992	31,710,654	536	6,248	33,171,481	654	6,256	40,453,090
Georgia	509	8,810	100,768,935	424	6,947	65,634,369	523	6,964	77,828,508	706	8,866	108,176,576
Idaho	246	2,256	30,341,896	190	2,354	23,105,170	224	1,599	20,982,027	286	1,912	33,584,217
Illinois	3,202	86,605	1,145,928,824	3,017	75,378	781,603,062	3,429	70,590	987,940,660	3,904	81,325	1,510,486,037
Indiana	1,323	28,743	312,615,429	1,071	21,682	176,528,302	1,250	19,977	213,237,048	1,515	22,530	307,169,363
Iowa	1,246	22,911	391,318,629	1,047	21,914	255,834,929	1,242	21,717	351,831,066	1,428	23,204	508,753,878
Kansas	780	14,857	294,815,778	636	14,467	198,880,170	754	13,655	243,804,776	883	16,766	472,137,198
Kentucky	632	10,636	134,158,290	456	6,606	67,243,936	584	5,934	63,195,158	736	6,703	91,074,410
Louisiana	678	15,000	171,828,252	531	11,261	119,810,941	631	11,093	143,695,656	731	13,745	206,192,021
Maine	340	5,083	27,842,995	305	3,744	18,935,006	394	3,811	23,262,457	486	5,354	33,986,937
Maryland	909	20,019	188,683,940	812	14,791	122,687,690	915	13,916	136,930,739	1,034	15,658	193,523,278
Massachusetts	1,817	30,005	274,136,396	1,732	26,016	201,801,646	1,922	25,240	243,959,809	1,908	28,405	321,785,009
Michigan	1,608	28,488	301,537,365	1,346	22,118	193,726,477	1,644	20,670	235,030,680	1,853	24,650	347,513,208
Minnesota	1,777	24,139	442,660,061	1,578	21,483	307,950,026	1,686	20,907	385,853,923	1,805	22,913	594,250,355
Mississippi	323	3,408	23,240,172	261	2,262	15,039,290	332	2,988	19,553,985	421	3,930	32,234,605
Missouri	1,411	25,619	349,117,012	1,174	22,957	250,841,235	1,453	22,801	307,113,876	1,767	26,551	501,884,734
Montana	249	2,145	32,327,864	183	1,857	25,629,628	211	1,678	25,115,623	240	1,890	38,492,640
Nebraska	568	10,784	188,346,208	477	10,555	147,507,006	575	11,051	217,100,181	649	12,546	336,995,362
Nevada	38	237	2,732,230	33	206	2,434,017	43	209	2,612,622	49	266	4,609,363
New Hampshire	126	1,059	8,226,017	99	737	4,919,852	140	856	7,003,459	181	905	9,252,295
New Jersey	1,743	26,388	318,709,537	1,176	21,003	216,790,361	1,478	19,454	262,993,362	1,761	23,108	358,486,534
New Mexico	100	493	3,473,227	73	364	2,047,396	90	373	2,632,058	103	459	3,746,611
New York	5,615	89,949	1,088,445,516	4,290	78,863	855,910,417	5,579	77,029	1,021,347,532	6,072	86,984	1,336,200,723
North Carolina	524	4,975	52,676,099	421	3,713	31,988,323	505	3,985	36,829,028	686	4,671	52,033,160
North Dakota	208	1,799	37,001,882	153	1,658	25,879,977	169	1,558	32,602,034	181	1,674	43,565,616
Ohio	2,516	39,564	439,346,170	2,050	33,099	297,990,653	2,482	31,517	368,342,436	2,860	35,378	546,113,443
Oklahoma	626	6,920	110,930,119	546	5,931	65,450,202	587	5,321	69,706,566	690	6,567	115,965,681
Oregon	573	8,677	94,421,973	443	7,054	59,610,831	534	6,781	71,048,906	690	9,092	114,568,073
Pennsylvania	3,378	63,929	619,709,045	2,981	53,214	456,135,303	3,600	52,096	537,332,476	4,163	56,792	706,598,844
Rhode Island	281	3,154	23,962,319	226	2,689	18,382,620	282	2,432	20,526,200	296	2,679	25,278,180
South Carolina	256	2,665	17,364,335	198	1,952	11,474,275	251	2,053	13,192,750	297	2,864	18,480,768
South Dakota	249	2,875	49,719,432	213	3,150	40,689,936	270	3,280	60,015,363	302	3,482	83,770,430
Tennessee	646	10,155	131,955,712	481	7,576	72,543,196	614	7,497	96,533,047	825	9,085	158,240,984
Texas	1,719	21,069	281,945,865	1,456	16,518	171,131,913	1,736	16,642	217,248,593	2,011	20,540	321,308,038
Utah	257	4,704	45,183,661	207	4,600	38,550,585	250	3,972	41,130,825	287	5,340	58,718,318
Vermont	144	1,014	17,405,392	118	819	10,990,779	134	904	14,088,409	174	1,166	27,479,733
Virginia	798	9,789	72,080,701	621	7,046	46,234,828	716	6,417	55,767,243	1,006	8,515	89,966,702
Washington	935	13,674	155,551,106	754	11,436	99,292,072	896	10,692	121,096,274	1,000	12,997	191,235,026
West Virginia	323	3,407	29,566,400	252	2,548	18,307,598	323	2,714	24,114,237	412	3,437	37,843,985
Wisconsin	3,671	28,290	418,264,752	3,069	23,415	296,294,847	3,455	21,559	321,240,680	3,931	25,265	474,887,691
Wyoming	101	940	11,900,440	78	791	10,012,768	96	713	9,982,203	104	875	12,313,428

* Not including salaried officers and employees.

Commodities Included Under Some of Industries Listed in 1935 Census of Manufacture

(Preliminary Figures—Subject to Revision)

	Valued at
Beverages, Non-alcoholic	
Carbonated beverages; 192,935,607 cases, and 5,978,743 gal. bulk	$158,525,348
Still beverages; 1,784,644 cases, and 437,756 gal. bulk	1,414,505
Cereal beverages; 3,642,748 gal.	1,108,003
Canned and Processed Fruits and Vegetables	
Canned vegetables and soups (including juices) 164,390,781 cases	301,389,938
Canned fruits and canned and bottled fruit juices 43,597,567 cases	112,986,899
Fruit juices in bulk, 4,347,225 gal.	1,935,797
Dried fruits, 1,119,691,255 lb.	56,905,745
Other products—	
Dried and dehydrated vegetables	161,885
Preserves, jams, jellies, fruit butters, etc.	29,200,597
Cereal Preparations—	
Breakfast foods, 1,151,536,585 lb.	99,344,148
Prepared flour, 785,788,082 lb.	35,443,275
Coffee substitutes, 12,242,643 lb.	2,922,612
Other cereal preparations	4,328,506
Chocolate and Cocoa Products	
Chocolate, 272,197,134 lb.	43,937,504
Chocolate Coatings, 295,321,372 lb.	29,504,720
Cocoa, powdered, 126,449,714 lb.	10,240,865
Cocoa butter, 41,826,834 lb.	5,314,740
Chocolate syrups, 3,743,707 gal.	3,405,720
Other chocolate and cocoa products	856,381
Confectionery	
Salted nuts, valued at $13,976,067 are included in total value of	$253,308,549
Corn Products	
Corn syrup, 783,959,169 lb.	21,259,540
Corn syrup, mixed with other syrups, 213,219,320 lb.	9,993,408
Corn sugar, 351,084,860 lb.	10,975,634
Corn oil, 137,008,916 lb.	14,696,866
Starch (inc. potato & other), 833,487,490 lb.	29,965,990
Corn oil cake and meal, 19,325 tons	452,906
Dextrine, 75,239,861 lb.	2,688,567
Ice Cream	
Ice cream, 197,352,248 gal.	183,974,664
Ices, 6,241,236 gal.	5,036,912
Specialties (cups, sticks, etc.), 22,755,824 gal.	25,903,294
Canned and Cured Fish	
Canned fish and shellfish (Alaskan pack omitted), 12,347,631 cases	45,091,604
Smoked fish, 34,587,584 lb.	5,582,014
Salted and pickled fish, 42,741,603 lb.	4,444,948
Flavoring Extracts and Syrups	
Flavoring syrups, 36,754,315 gal.	40,862,082
Flavoring extracts, 4,647,719 gal.	21,896,980
Crushed fruits, 1,883,473 gal.	3,504,501
Flavoring concentrates, 1,015,491 lb.	1,854,469
Fruit juices, 1,641,644 gal.	2,237,413
Colors	2,265,395
Flour Milling	
Wheat flour, 99,792,086 bbl.	646,437,219
Rye flour, 1,509,133 bbl.	$5,914,056
Buckwheat flour, 25,197,692 lb.	656,723
Other flour, except corn, 14,228,703 lb.	1,038,186
Meat Packing Products	
Fresh meat, 8,807,523,229 lb.	1,147,870,478
Cured meat, 2,139,460,520 lb.	440,989,915
Canned meat, 182,631,940 lb.	34,958,201
Canned sausage, 19,145,746 lb.	4,555,492
Sausage (not canned), meat puddings, headcheese, etc.* 825,408,464 lb.	140,429,281
*Meat packing industry only. The total amount of sausage, meat puddings, headcheese, etc., produced in all industries was 1,353,301,632 pounds valued at $233,077,321.	
Lard, 915,645,875 lb.	128,815,334
Shortenings, Cooking Oils and Salad Oils	
Shortenings (other than lard), 1,505,827,956 lb.	176,753,840
Vegetable cooking oils, salad oils, and other edible oils, 822,239,718 lb.	79,703,079

Note: Total value of products of an industry as given in this table does not agree in all cases with total given in census, because totals in census include products of the industry other than product named. This table omits those products, and includes any quantity of the named product that may be made in other industries, but is not shown in the census total.

Imports and Exports of Foods

IN considering the data of United States food production given on the preceding three pages, it should be remembered that the total quantities available for domestic consumption are modified by imports and exports. What these imports and exports amount to in quantity, and the trends which they have exhibited during the past eight years, are set forth on this page by means of data gathered by the United States Department of Commerce.

Food Imports and Exports by Countries, 1935

In Millions of Dollars (000000 omitted)

Country	Crude Foodstuffs		Manufactured Foodstuffs	
	Imports	Exports	Imports	Exports
All countries	349	58	394	144
Five leading countries	211	43	241	90
United Kingdom	.....	27	.....	56
Canada	84	18	48	8
Cuba	5	2	40	12
France	2	4	13	8
Netherlands	.....	2	8	6
Brazil	79	.....	.....	.....
Philippine Islands	.....	.....	62	.....
Colombia	41	.....	.....	.....

Food Imports and Exports By Leading Food Products

Value in Millions of Dollars (000000 omitted)

Commodity	1933		1934		1935		1936	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
All food products	417	203	518	227	641	216	733	202
Coffee	124	1	133	2	137	1	130	2
Cane sugar	108	.....	118	.....	134	.....	155	.....
Fruits and nuts	37	170	46	189	55	176	58	81
Wine and spirits	13	.....	49	.....	41	.....	75	.....
Packing house products	10	66	15	67	23	43	30	41
Fish	22	7	23	12	28	13	30	12
Vegetables and preparations	15	8	16	9	19	11	20	12
Wheat and flour	6	19	15	27	30	15	44	19

Exports of Important Foods from the United States

1936 Figures are Preliminary

All Figures in Thousands (000 omitted)

Commodity	Year 1936		Year 1935	
	Quantity	Value	Quantity	Value
Hams and shoulders, cured	41,971 lb.	$8,771	55,380 lb.	$10,279
Lard	111,292 lb.	13,494	96,355 lb.	11,870
Canned salmon	38,893 lb.	6,404	45,312 lb.	6,916
Canned sardines	42,688 lb.	2,531	45,454 lb.	2,728
Wheat flour	3,661 bbl.	17,498	3,297 bbl.	14,924
Canned asparagus	16,096 lb.	2,179	19,336 bbl.	2,426
Dried and evaporated fruit	337,982 lb.	20,133	403,930 lb.	23,900
Canned fruit	258,148 lb	18,955	322,481 lb.	23,818
Refined sugar	123,432 lb.	2,722	227,911 lb.	5,334

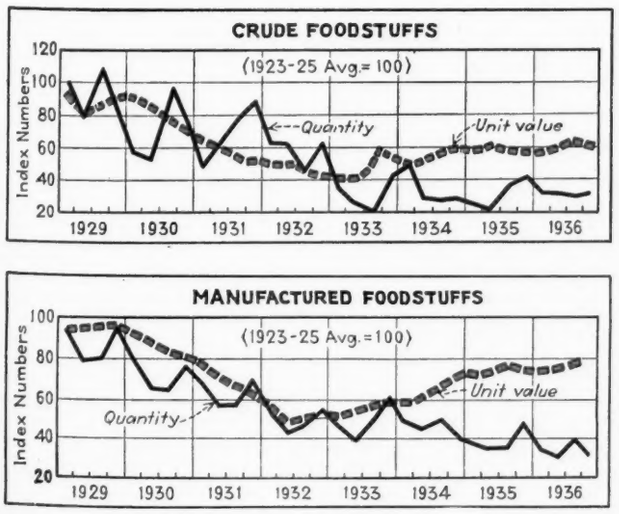
Imports of Important Foods into the United States

1936 Figures Preliminary

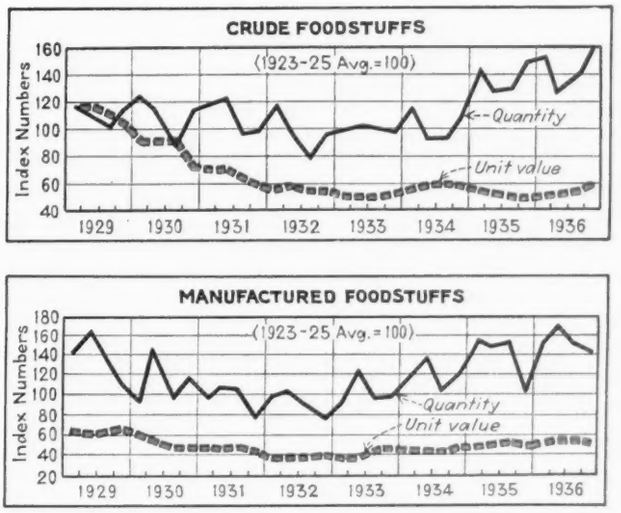
All Figures in Thousands (000 omitted)

Commodity	Year 1936		Year 1935	
	Quantity	Value	Quantity	Value
Fresh pork	12,944 lb.	$1,790	3,923 lb.	$541
Cured pork (hams, bacon, etc.)	26,088 lb.	7,041	5,297 lb.	1,261
Canned meats	87,920 lb.	8,430	76,653 lb.	5,626
Butter	9,874 lb.	2,016	22,675 lb.	3,577
Cheese	59,849 lb.	12,717	48,933 lb.	11,201
Tuna fish in oil	6,843 lb.	1,099	8,185 lb.	1,263
Lobsters, not canned	11,122 lb.	2,487	10,020 lb.	2,100
Barley malt	301,767 lb.	7,162	320,623 lb.	9,043
Tapioca, prepared	263,211 lb.	5,326	200,178 lb.	4,136
Tomatoes, canned	59,988 lb.	2,283	76,793 lb.	3,086
Cottonseed oil	127,787 lb.	7,371	166,687 lb.	8,880
Cocoa beans	631,884 lb.	33,001	606,311 lb.	26,566
Coffee	1,739,191 lb.	133,962	1,754,679 lb.	136,721
Tea	82,477 lb.	17,885	86,235 lb.	17,180
Bananas	58,302 bunches	28,675	55,019 bunches	28,034

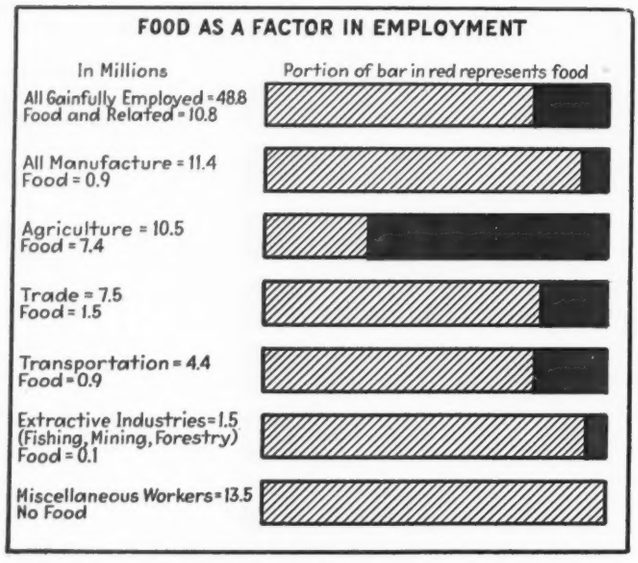
Imports of crude and manufactured foodstuffs into the United States, 1929-1936.



Exports of crude and manufactured foodstuffs from the United States, 1929-1936.



Food As A Factor IN EMPLOYMENT

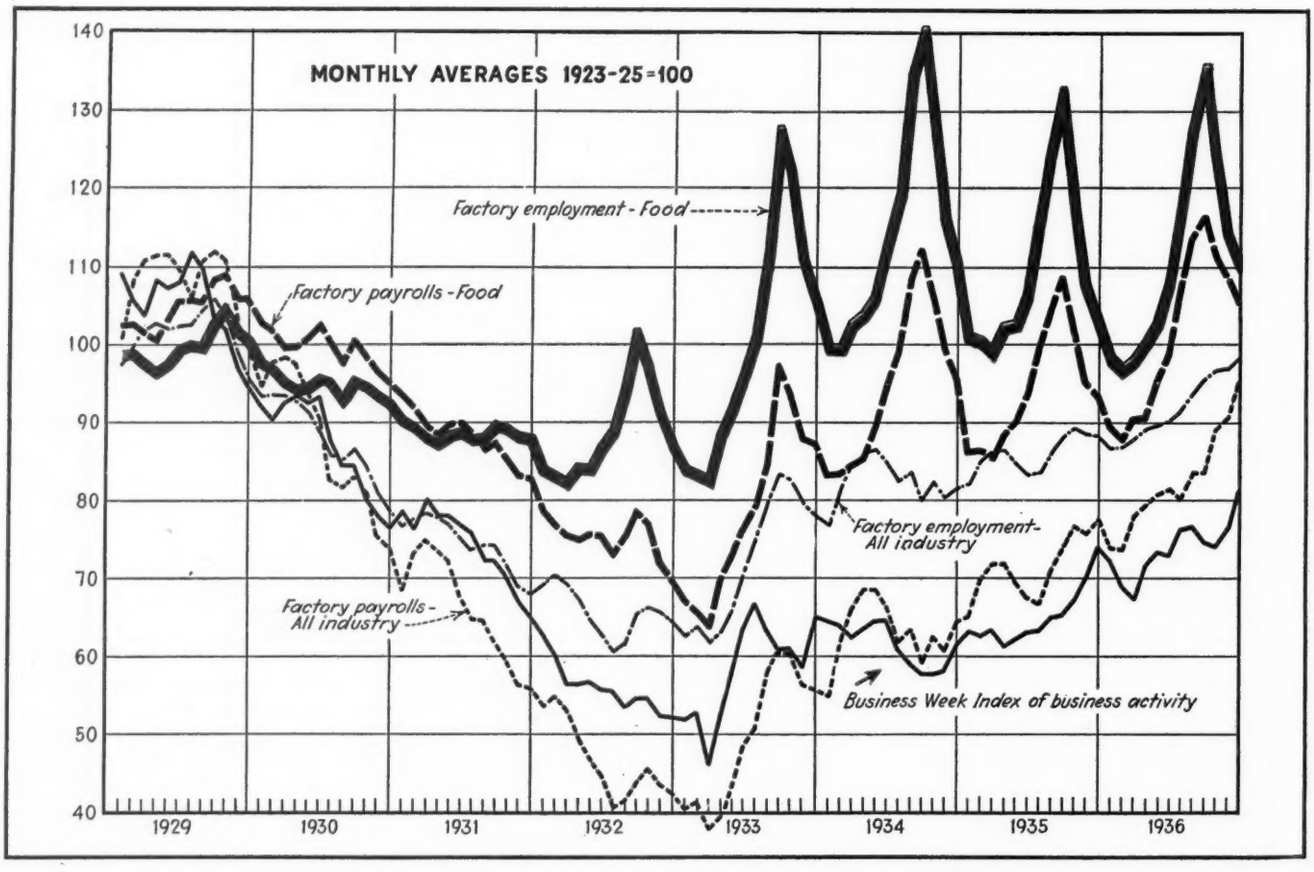


Based on the last employment census, made by the United States Government in 1930, FOOD INDUSTRIES has made the estimates shown in this chart of the part that food production and distribution plays in gainful employment.

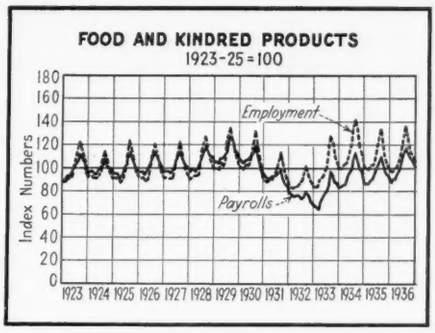
ACCURATE DATA from the Bureau of Labor Statistics, United States Department of Labor, are given on this and on the following page, showing how employment and payrolls in the food industries as a whole, and in various branches of food manufacture, compare to employment and payrolls in all industry.

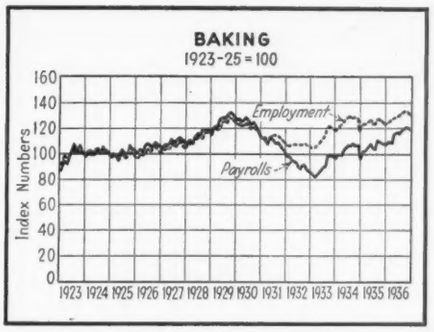
In addition, it is important to consider how growing and transporting of food materials and operations of food trade compare to these same activities for all products. The estimates on these latter points are by FOOD INDUSTRIES.

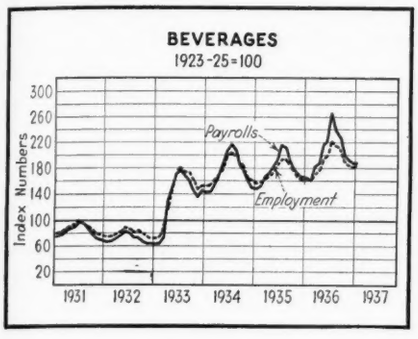
The data on these pages indicate how important food manufacture is as a factor in employment and purchasing power, as its activities require the services of nearly a quarter of all gainfully employed Americans.

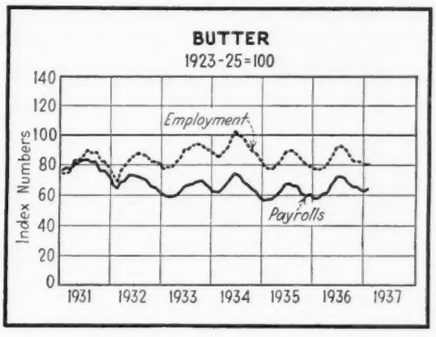


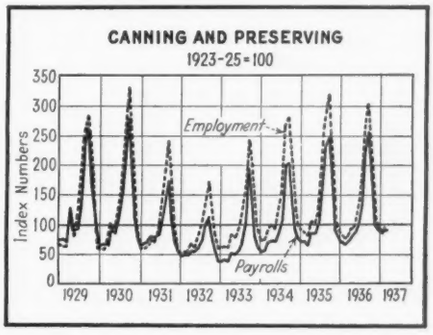
Relation of employment and payrolls in the food industries to employment and payrolls in all manufacturing industries and to general business activity.

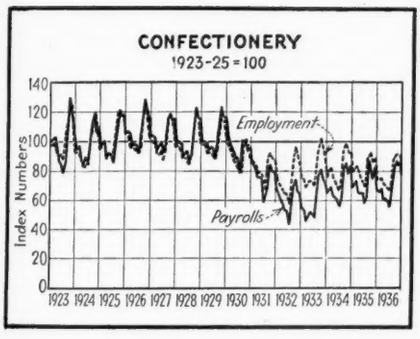


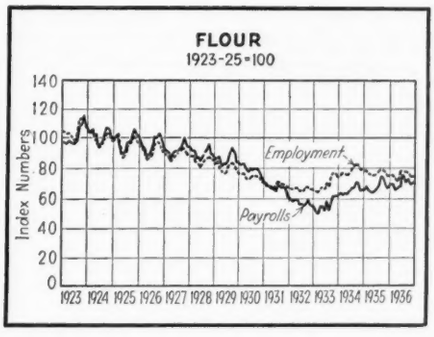


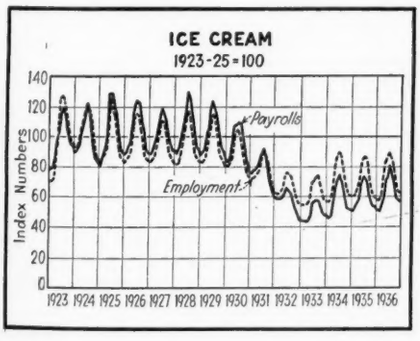


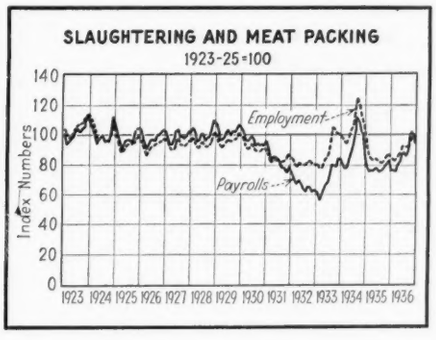


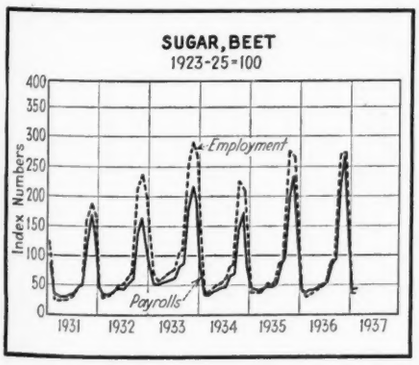


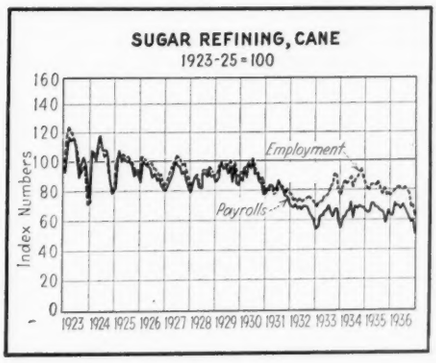












Employment and payrolls in all manufacturing, and in all food manufacturing, compared to employment and payrolls in ten important branches of the food industries.

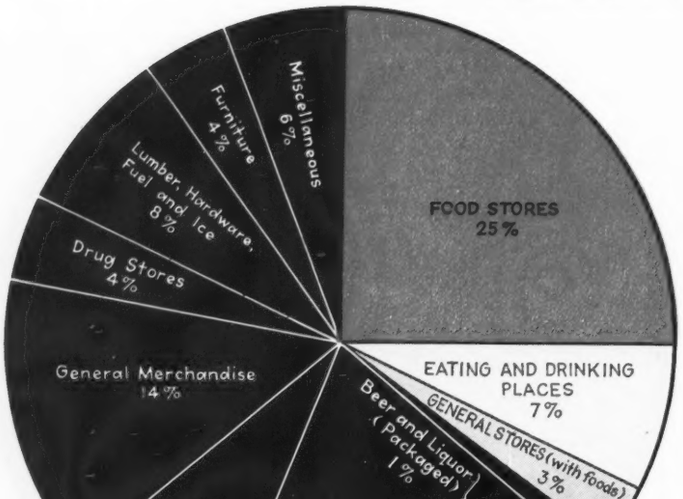
Indexes of Average Hours Worked per Week and Average Hourly Earnings

Month and year	Manufacturing: Hours worked	Manufacturing: Earnings	Food Group: Hours worked	Food Group: Earnings
1932				
January	100.0	100.0	.....	.....
February	102.1	99.0	.....	.....
March	100.6	97.8	.....	.....
April	97.2	97.2	.....	.....
May	96.9	96.6	.....	.....
June	94.5	94.6	.....	.....
July	91.7	93.4	.....	.....
August	93.3	92.5	.....	.....
September	98.4	90.9	.....	.....
October	101.1	90.1	.....	.....
November	98.3	89.6	.....	.....
December	97.8	89.0	.....	.....
1933				
January	95.6	87.7	.....	.....
February	97.4	86.7	.....	.....
March	93.3	86.1	.....	.....
April	97.1	85.3	.....	.....
May	104.3	84.1	.....	.....
June	108.9	83.9	.....	.....
July	108.7	84.5	.....	.....
August	99.1	95.8	.....	.....
September	93.5	101.9	.....	.....
October	92.7	103.5	.....	.....
November	89.4	104.3	.....	.....
December	88.9	105.0	.....	.....
1934				
January	88.1	105.9	.....	.....
February	93.5	106.1	.....	.....
March	95.1	106.6	100.0	100.0
April	95.1	108.6	99.2	100.2
May	93.8	109.5	100.7	101.9
June	91.7	110.1	100.4	101.3
July	87.8	111.3	97.9	101.9
August	89.3	111.3	100.2	98.4
September	87.5	112.1	101.8	96.6
October	89.8	110.9	100.0	100.6
November	89.3	110.9	101.0	102.4
December	92.1	112.1	101.3	104.8
1935				
January	92.1	112.5	99.5	105.2
February	95.6	113.0	100.8	105.2
March	95.8	113.4	100.8	105.8
April	95.4	114.0	101.1	105.8
May	93.8	114.0	102.1	106.4
June	93.1	114.3	103.1	105.8
July	92.5	113.3	105.2	102.2
August	96.2	113.1	103.9	101.0
September	98.3	112.1	104.4	98.0
October	100.2	112.3	103.9	101.0
November	99.2	112.7	103.7	103.7
December	101.6	113.5	106.1	104.6
1936				
January	98.0	113.9	105.0	106.2
February	98.1	113.6	103.3	106.6
March	101.3	113.7	105.6	107.0
April	101.8	113.9	103.2	106.4
May	103.0	114.1	107.1	106.8
June	102.9	114.2	106.5	105.5
July	101.2	113.8	106.8	104.6
August	103.4	113.3	107.3	102.4
September	101.7	112.7	106.1	99.7
October	106.2	113.6	108.6	101.5
November	106.4	115.1	109.6	106.8
December	107.8	118.1	109.2	108.7

FOOD MERCHANDISING

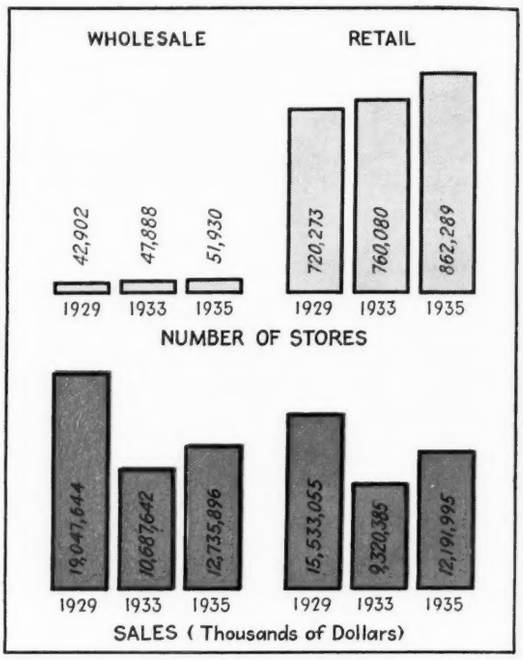
Wholesale and Retail

Source: 1935 Census of Business



Major Divisions of Retail Merchandising. U.S. Totals for 1935 from Census of Business.

Food Distribution, 1929, 1933, 1935 from U.S. Census of Business



Wholesale Establishments Handling Foods and Groceries

Census of Business, 1935

A. Classified by Type of Business

Type of Business	Number of Establishments	Number of Employees	Payroll	Other Expense	Net Sales	Dec. 31, 1935 Stocks on Hand
			In Thousands of Dollars			
Full-Service and Limited-Function Wholesalers	32,673	255,905	357,353	331,561	6,276,293	477,065
Manufacturers' Sales Branches (With Stocks)	3,806	61,173	105,927	151,208	2,589,548	104,531
Manufacturers' Sales Offices (Without Stocks)	248	4,228	9,589	34,578	338,407	.....
Agents and Brokers	3,797	15,476	30,208	26,393	2,596,139	16,796
Assemblers	11,406	55,422	44,269	52,407	935,509	17,438
Total	51,930	392,204	547,346	596,147	12,735,896	615,830
Beer, Wines and Liquors	5,983	37,822	58,167	81,201	1,067,076	75,136
Farm Products — Consumer Goods	23,818	138,362	169,391	179,049	3,648,229	67,841
Groceries and Foods — Full Lines and Specialties	22,129	216,020	319,788	335,897	8,020,591	472,853
Per cent of All Wholesale represented by Total of Foods	29%	31%	27%	27.8%	29.7%	19.8%

Note.— These percentages are minimums for wholesalers dealing mainly in foods.
There are probably some establishments selling foods grouped in classes not included here.
There are probably some establishments of the classes included here which have been grouped for Census purposes under "All Others."

B. Classified by Major Types of Goods

Types of Goods	Number of Establishments	Number of Employees	Payroll	Other Expense	Net sales	Dec. 31, 1935 Stocks on hand
			In Thousands of Dollars			
Beverages — Total	6,443	40,190	61,661	84,233	1,094,734	77,195
Beer and other fermented malt liquors	4,282	18,078	23,360	30,754	349,629	12,475
Wines and liquors	1,664	18,816	32,337	43,669	636,167	62,661
Alcoholic beverages (not divided)	37	928	2,470	6,778	81,280	.....
Soft drinks	460	2,368	3,494	3,032	27,658	2,059

B. Classified by Major Types of Goods — (Concluded)

Types of Goods	Number of Establishments	Number of Employees	Payroll	Other Expense	Net sales	Dec. 31, 1935 Stocks on hand
			In Thousands of Dollars			
Confectionery — Total	2,191	7,656	9,722	7,745	166,302	11,342
Dairy and Poultry Products — Total	13,744	58,776	74,509	72,885	1,553,885	31,471
Dairy Products	5,080	30,530	43,347	41,950	636,300	11,585
Poultry and Poultry Products	4,098	15,154	15,206	15,773	464,277	9,239
Mixed Dairy and Poultry Products	4,566	13,092	15,956	15,162	453,308	10,647
Fruits and Vegetables — Total	10,645	83,329	103,433	116,312	2,541,967	57,246
Farm (fresh)	9,642	74,810	87,146	94,738	2,008,503	33,353
Canned	1,003	8,519	16,287	21,574	533,464	23,893
Meat and Related Products — Total	4,559	47,794	70,682	64,310	1,767,015	49,903
Meat	3,211	39,101	58,772	53,117	1,613,901	43,089
Fish	1,348	8,693	11,910	11,193	153,114	6,814
Groceries — Total	14,348	154,459	227,339	250,662	5,611,993	388,673
Coffee, Tea, and Spice	1,120	12,283	19,901	19,845	345,429	25,922
Flour	793	4,888	7,604	8,308	265,601	10,580
Sugar	354	2,224	4,321	3,580	630,609	5,144
Full-line Groceries	3,854	67,642	98,212	75,807	1,965,327	242,191
Specialties and Miscellaneous	8,227	67,422	97,301	143,122	2,405,027	104,836
All Foods — Total	51,930	392,204	547,346	596,147	12,735,896	615,830

C. Food Raw Materials

Total	13,559	35,522	43,035	51,622	3,385,206	137,168
Grain	9,795	24,891	30,365	38,329	1,829,224	132,013
Livestock	3,764	10,631	12,670	13,293	1,555,982	5,155

Retail Stores Handling Foods

Classified by Types of Agency —— From Census of Business: 1935

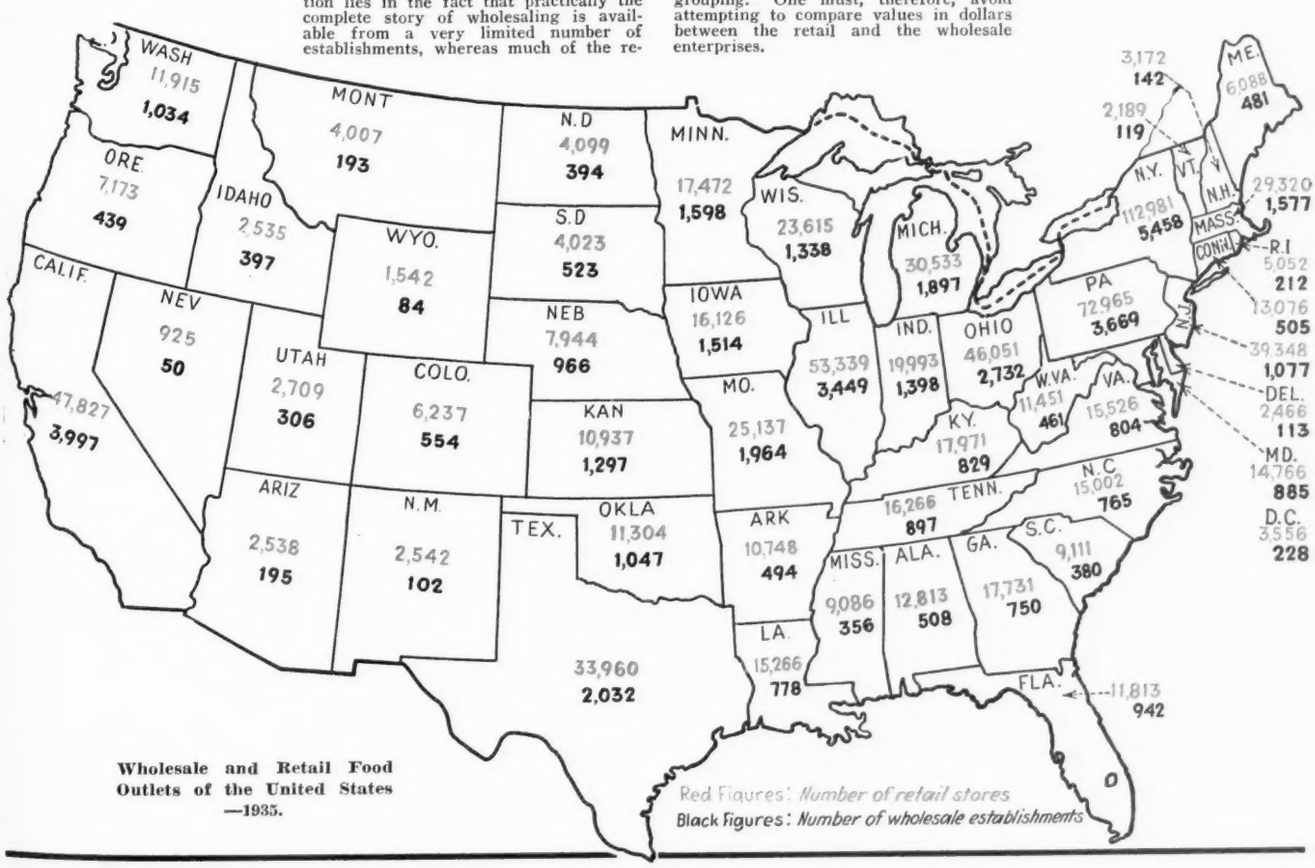
	Number of Stores	Number of Employees	Payroll	Other Expenses	Net Sales
			In Thousands of Dollars		
Grocery stores (without meats) — total	188,738	156,031	125,802	156,160	2,202,607
Independents	164,404	81,193	54,566	92,143	1,339,524
Chains	22,632	72,698	69,385	62,065	842,075
Direct selling (house-to-house)	87	790	866	872	3,634
Commissaries or company stores	349	183	160	78	2,982
All other types	1,266	1,167	825	1,002	14,392
Combination stores (groceries and meats) — total	166,233	359,716	304,006	313,793	4,149,813
Independents	139,994	206,746	157,635	173,590	2,509,867
Chains	25,607	151,662	145,130	139,145	1,624,513
Commissaries or company stores	94	222	260	151	3,355
All other types	538	1,086	981	907	12,078
Beer and liquor stores (packaged) — total	12,105	16,312	19,458	22,097	328,307
Independents	9,718	10,816	10,603	16,166	157,696
Chains	226	428	563	652	6,020
State liquor stores*	2,053	4,954	8,196	5,170	160,665
All other types	108	114	96	109	3,926
Restaurants and eating places — total	153,468	495,752	312,232	441,856	1,666,899
Independents	146,747	412,640	252,718	358,012	1,299,785
Chains	3,988	76,145	54,912	77,170	242,354
All other types	2,733	6,967	4,602	6,674	24,760
Drinking places — total	98,005	151,183	101,488	144,465	723,961
Independents	97,205	149,787	100,621	143,253	718,215
Chains	46	163	136	120	813
All other types	754	1,233	731	1,092	4,933
Food specialty stores — total	177,039	229,356	233,610	251,681	2,010,005
Candy and confectionery stores	55,197	37,191	23,126	52,933	314,467
Dairy products and milk dealers	16,380	79,964	114,994	74,381	576,351
Egg and poultry dealers	5,747	4,662	2,951	4,618	52,404
Delicatessen stores	6,554	7,141	5,677	10,594	88,708
Fruit and vegetable markets	32,632	23,217	16,770	22,424	215,965
Meat markets	32,555	45,258	44,551	52,491	565,640
Fish markets — seafood	6,919	6,220	4,481	6,402	46,811
Bakeries and caterers	14,150	16,604	12,836	19,004	99,908
Other food stores	6,905	9,099	8,224	8,834	49,751
General stores (with food)	66,701	82,841	60,735	60,755	1,110,403
Grand Total	862,289	1,491,191	1,156,821	1,394,807	12,191,995

* Includes county or municipal liquor stores in some states.

Wholesale and Retail Food Sales by States, 1935

	Wholesale	Retail
Alabama	$98,708,000	$135,836,000
Arizona	31,798,000	42,943,000
Arkansas	80,426,000	105,678,000
California	1,247,372,000	795,888,000
Colorado	104,631,000	101,417,000
Connecticut	119,186,000	211,258,000
Delaware	15,571,000	26,896,000
Dist. of Columbia	85,401,000	107,613,000
Florida	180,164,000	147,294,000
Georgia	197,595,000	166,527,000
Idaho	36,834,000	46,084,000
Illinois	1,191,975,000	708,090,000
Indiana	172,109,000	239,219,000
Iowa	175,228,000	211,078,000
Kansas	100,408,000	143,090,000
Kentucky	118,682,000	156,884,000
Louisiana	223,527,000	133,788,000
Maine	63,589,000	93,739,000
Maryland	193,551,000	174,760,000
Massachusetts	560,435,000	589,140,000
Michigan	354,613,000	438,978,000
Minnesota	284,405,000	289,427,000
Mississippi	64,150,000	69,125,000
Missouri	430,645,000	310,415,000
Montana	41,338,000	74,117,000
Nebraska	131,512,000	116,617,000
Nevada	6,026,000	20,436,000
New Hampshire	24,662,000	61,746,000
New Jersey	278,815,000	538,776,000
New Mexico	21,312,000	31,198,000
New York	2,572,222,000	1,979,491,000
North Carolina	125,567,000	151,246,000
North Dakota	394,000	52,874,000
Ohio	512,598,000	709,591,000
Oklahoma	112,328,000	134,365,000
Oregon	96,907,000	119,157,000
Pennsylvania	953,845,000	986,838,000
Rhode Island	57,425,000	84,281,000
South Carolina	77,513,000	92,725,000
South Dakota	28,782,000	50,978,000
Tennessee	187,180,000	169,498,000
Texas	396,011,000	412,236,000
Utah	41,915,000	42,420,000
Vermont	25,729,000	37,232,000
Virginia	169,824,000	179,130,000
Washington	242,730,000	194,282,000
West Virginia	85,125,000	153,311,000
Wisconsin	269,593,000	318,856,000
Wyoming	9,739,000	32,439,000
Total	$12,630,784,000	$12,189,007,000
Unclassified	$105,112	$2,988,000

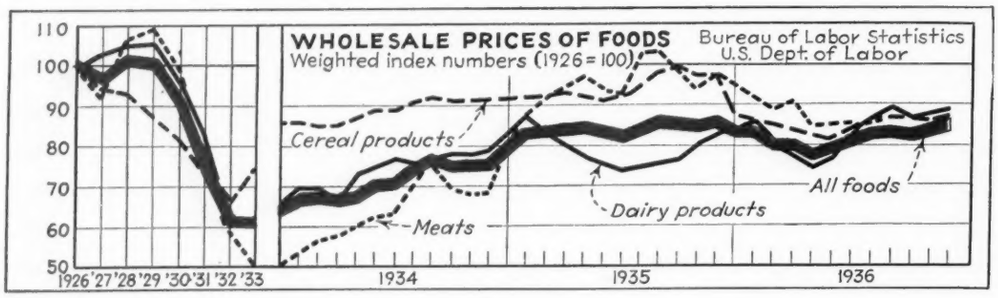
NOTE: It appears anomalous that the value at wholesale is greater than the value at retail of foods. The explanation lies in the fact that practically the complete story of wholesaling is available from a very limited number of establishments, whereas much of the retail merchandising represents goods that does not show up in this Census in stores which can be segregated in this grouping. One must, therefore, avoid attempting to compare values in dollars between the retail and the wholesale enterprises.



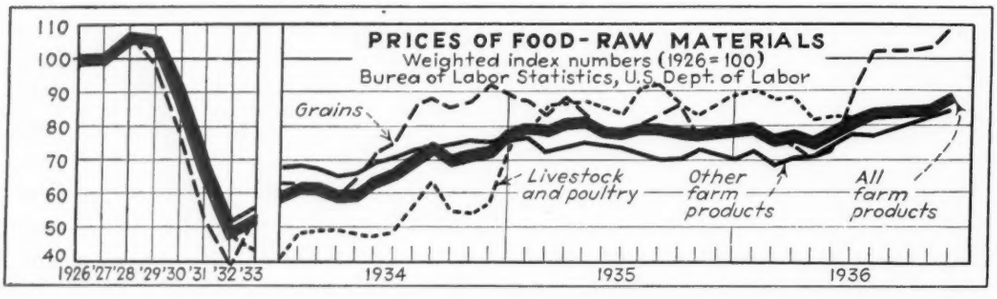
Wholesale and Retail Food Outlets of the United States —1935.

FOOD PRICES

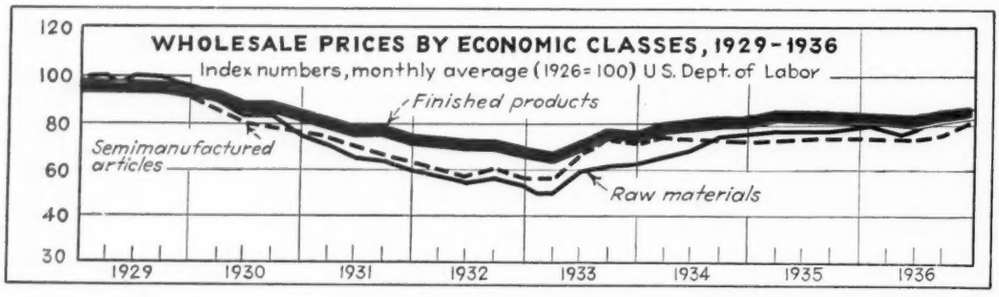
COST OF RAW MATERIALS, wholesale prices received by food manufacturers, retail prices paid by consumers of foods, and the cost of living index which governs to some extent that part of income which consumers can expend for food, all these are governing factors in the operation of the food industries. The charts and tables on this and the following page show how these figures have trended in recent years. The data for the charts are from the United States Department of Labor, the cost of living from the National Industrial Conference Board.



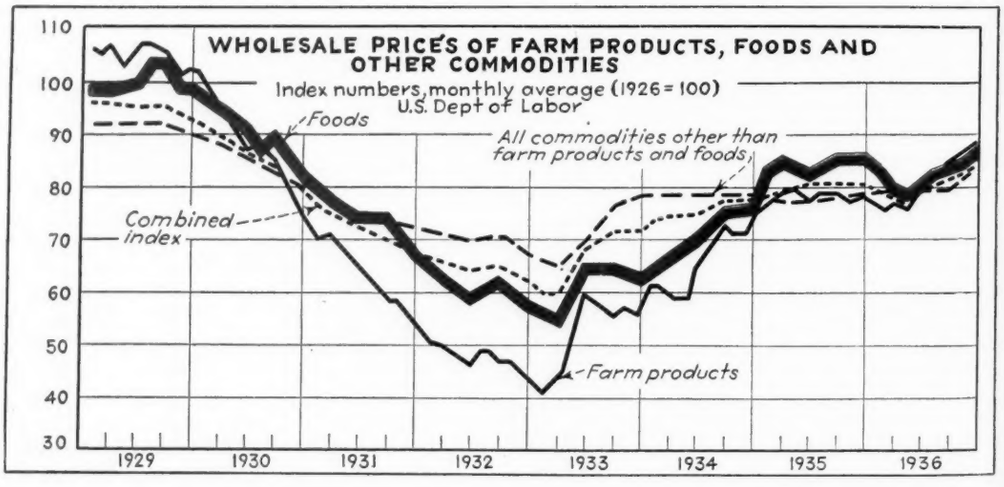
Wholesale Prices of Foods Weighted Index Numbers (1926=100)



Prices of Food Raw Materials Weighted Index Numbers (1926=100)



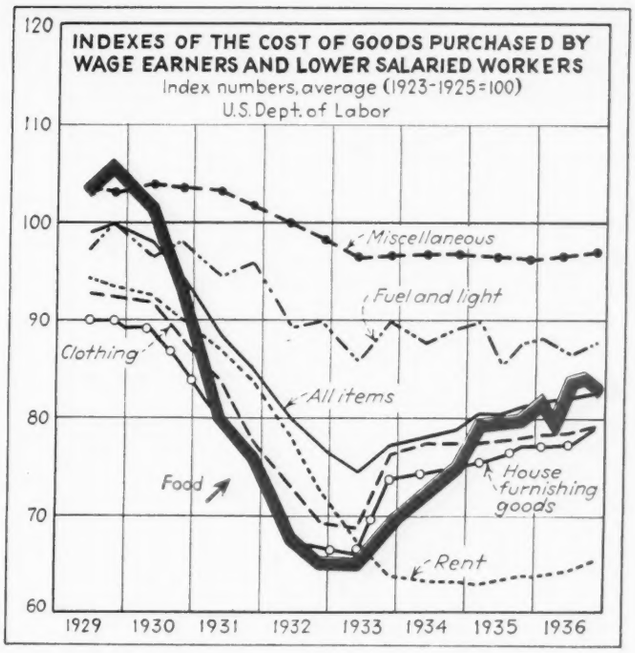
Variations in Wholesale Prices by Economic Class, All Commodities, 1929-1936



Variations in Wholesale Prices of Farm Products, Foods, and Other Commodities, 1929-1936

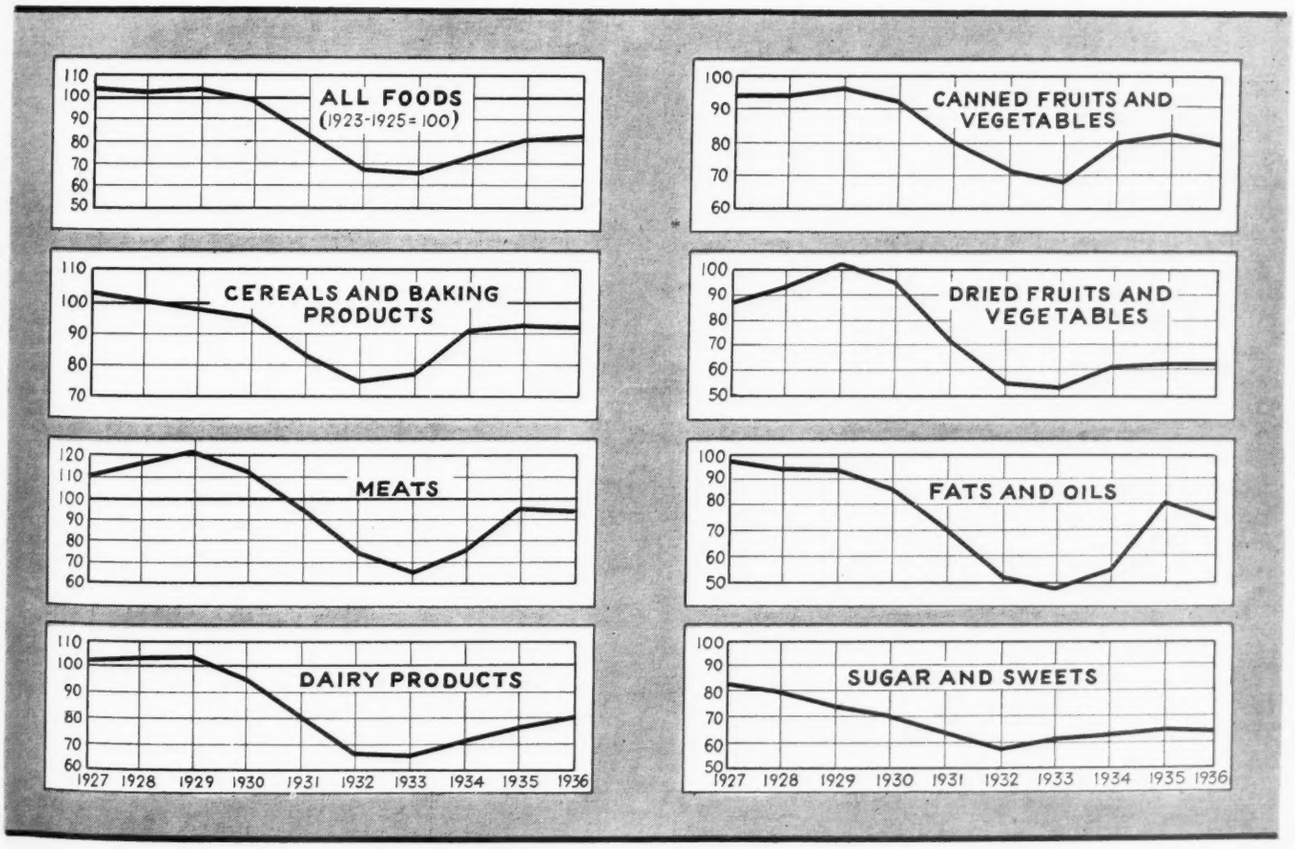
Cost of Living—National Industrial Conference Board

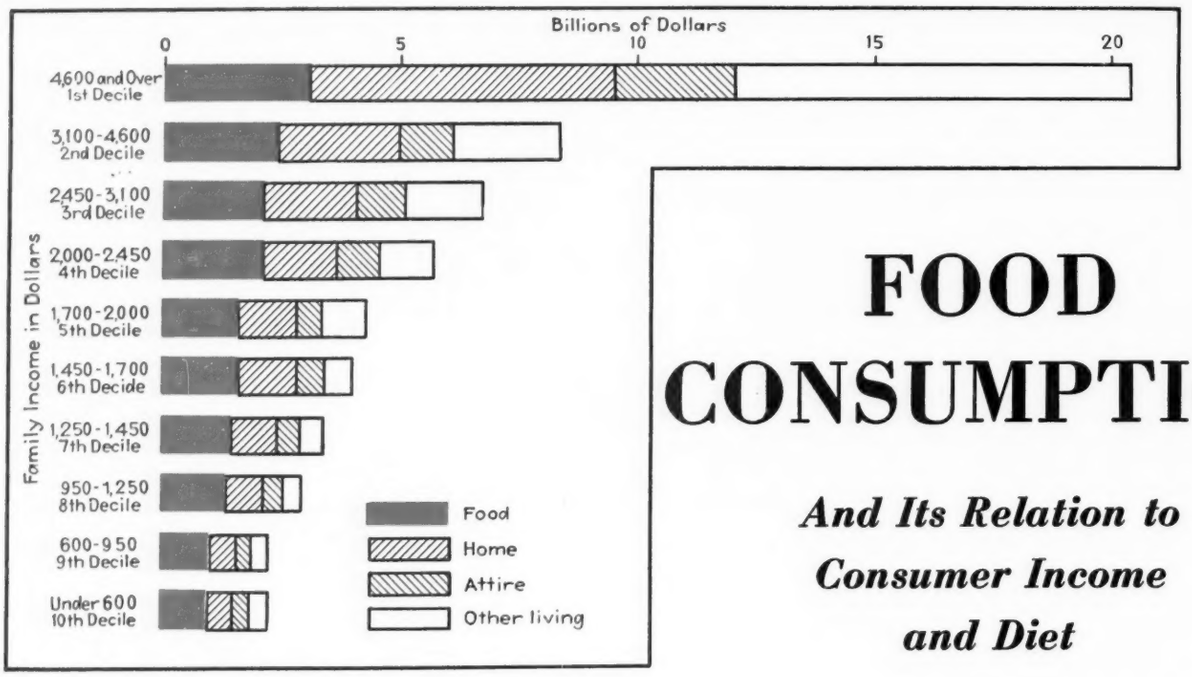
Year & Month	Combined (1923=100) Index	Clothing	Food	Fuel and Light	Housing	Sundries
1933						
January	73.7	62.6	63.9	86.0	66.4	91.6
February	72.2	61.8	61.4	85.9	65.4	90.4
March	71.8	61.2	61.1	85.8	64.6	90.3
April	71.7	60.7	61.4	84.6	64.0	90.3
May	72.3	60.7	63.8	82.8	63.5	90.3
June	73.1	61.6	66.3	82.2	63.4	90.2
July	75.7	63.9	72.5	82.6	63.2	91.2
August	77.3	70.0	73.5	84.3	63.2	92.7
September	78.2	75.6	73.4	85.9	63.6	93.1
October	78.0	77.7	72.7	87.0	63.2	92.2
November	77.8	77.8	72.3	87.4	62.8	92.3
December	77.4	77.4	71.2	87.5	62.8	92.3
1934						
January	77.7	77.3	72.0	87.1	62.7	92.6
February	78.5	77.5	74.1	87.1	62.8	92.9
March	78.8	77.7	74.4	87.1	63.1	93.0
April	78.7	77.9	73.7	86.5	63.7	93.1
May	79.0	77.8	74.6	85.7	64.2	93.2
June	79.2	77.3	74.8	85.8	64.6	93.3
July	79.3	77.0	75.2	86.4	64.7	93.3
August	79.7	77.2	75.9	86.9	65.4	93.1
September	80.8	77.6	78.8	87.4	66.0	93.2
October	80.5	77.5	77.4	87.5	66.4	93.5
November	80.4	77.4	76.9	87.6	66.6	93.6
December	80.3	77.3	76.1	87.5	66.8	93.8
1935						
January	81.2	76.9	79.2	87.2	66.9	93.7
February	82.0	76.3	81.4	87.2	67.4	93.7
March	82.0	76.0	81.3	87.2	67.9	93.8
April	82.8	75.4	83.4	86.1	68.7	93.8
May	82.6	75.0	83.2	84.0	69.6	93.3
June	82.6	74.5	83.2	83.8	69.9	93.5
July	82.4	74.4	81.9	83.9	70.5	93.8
August	82.4	74.2	81.3	84.1	71.5	93.8
September	82.7	74.3	81.7	84.8	72.1	93.8
October	83.0	74.4	81.9	86.3	72.7	94.1
November	83.4	74.5	82.7	86.7	73.0	94.2
December	83.9	74.6	83.8	86.8	73.4	94.2
1936						
January	83.9	74.5	83.5	86.9	73.9	94.3
February	83.5	74.1	82.3	87.1	74.1	94.4
March	83.2	74.0	81.0	87.1	74.7	94.4
April	83.4	73.8	81.0	86.7	75.9	94.4
May	83.8	73.6	81.7	84.7	77.1	94.4
June	85.1	73.3	85.6	84.5	77.6	94.3
July	85.2	73.0	85.8	84.7	78.1	94.4
August	85.6	73.2	85.8	85.0	79.3	94.5
September	85.9	73.6	86.1	85.6	80.3	94.5
October	85.7	73.8	84.6	86.2	80.8	94.9
November	85.8	74.0	84.3	86.5	81.4	95.1
December	86.1	74.1	84.7	86.6	81.3	95.3



Indexes of the Cost of Goods Purchased by Wage Earners and Lower-Salaried Workers, 1929-1936. Data represents an average for 32 large cities for all items except the food index, which represents an average of 51 cities

Indexes of Retail Food Costs in 51 Large Cities Combined, by Commodity Groups (1923-1925=100)





Expenditures, by families, for food, home, attire and other living costs for 1929, the most recent census year in which relief expenditures did not throw the picture out of balance for the lower income groups. In this chart, drawn from data of the Brookings Institution, each bar represents an income class of approximately 2,750,000 families, as there were approximately 27,500,000 families listed in the 1929 census.

FOOD CONSUMPTION

And Its Relation to Consumer Income and Diet

CONSUMPTION OF FOOD is more constant than the consumption of most other industrial goods, but it does vary with many economic, social and personal considerations. This variation appears much greater when viewed from the aspect of dollar value than quantity. Therefore problems of food supply and food consumption must be considered both in terms of money and terms of pounds, or calorie units.

Among the significant factors are family income and family expenditures for food. These have been determined by the Brookings Institution and are given here in a chart It shows how food consumption increases with income, but how much more rapidly other expenditures increase as the comfort level is reached and passed.

Other items shown on this and the following page include yearly per capita consumption of important foods, trends in per capita food consumption for the past twenty years, the effect of individuality on food consumption, and suggested diets, all from data of the United States Department of Agriculture.

In using such statistical material as is given on these pages, it should be remembered that there is no such thing as an ideal diet. Yet there are useful indexes of food requirements for families at various income levels, and for individuals of different age, sex, or activity. The data given here, from the Bureau of Home Economics, make clear the more important of these relationships.

In all studies of food consumption, diet, and related questions, it is important to remember that the average, or typical, item is a constantly shifting variable. Trends and relative values are, therefore, far more important than absolute figures.

Estimates of yearly consumption of principal foods or food groups, by non-farm families based on studies of family diets between 1913 and 1933 * (Source: Journal of Home Economics)

Foods	Estimated Average Consumption at Various Yearly per Capita Expenditures for Food							
	$32 to $65	$65 to $97	$97 to $161	$129 to $161	$161 to $193	$193 to $226	$226 to $258	$258 to $290
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Grain products	150	170	170	180	190	190	190	190
Milk	125	230	270	340	350	365	380	400
Potatoes, sweet potatoes	100	125	145	150	150	150	150	150
Dried legumes	10	12	13	14	15	15	15	15
Tomatoes and citrus fruits	20	35	35	70	90	110	120	130
Green, leafy, and yellow vegetables	20	40	65	80	90	100	120	140
Other vegetables	20	30	45	55	65	75	80	85
Other fruits	40	90	150	175	200	210	220	230
Sugar	30	45	55	60	65	70	70	70
Butter	7	10	15	18	23	28	32	35
Other fats and fatty foods	20	21	23	25	25	24	23	22
Lean meat, fish, poultry	70	90	100	120	140	160	175	200
Eggs	10	20	27	35	42	45	48	45
Total	622	918	1,133	1,322	1,445	1,542	1,623	1,712

* Adjusted to March-to-May 1935 values by the United States Bureau of Labor Statistics retail food index.

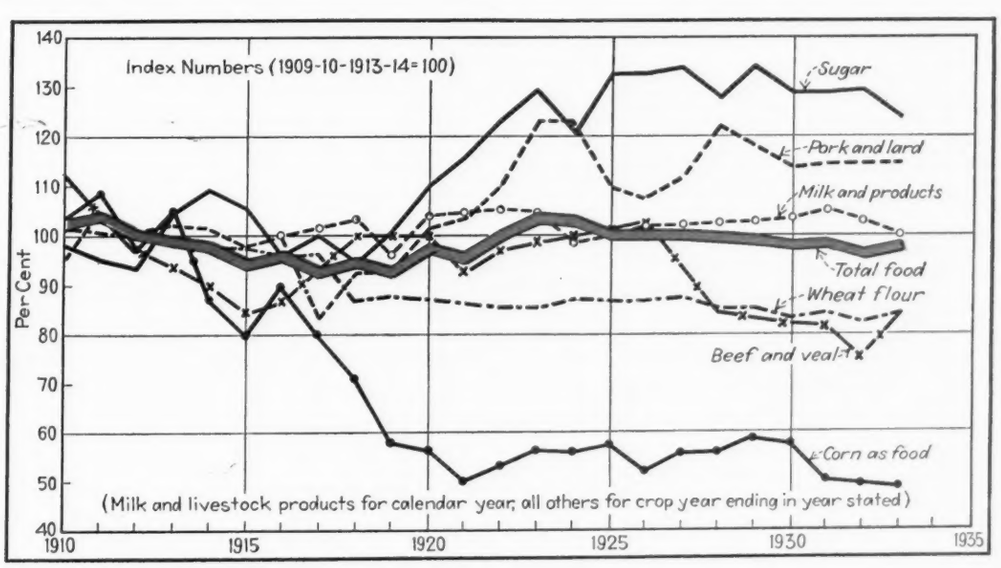
Food	Liberal Diet	Moderate Cost Adequate Diet	Minimum Cost Adequate Diet
Milk: Fluid milk or corresponding quantities of canned or dried milk, or cheese	21 qt.	21 qt.	17½ qt.
Vegetables and fruits			
Potatoes and sweet potatoes	9 lb.	10 lb.	11 lb.
Tomatoes (fresh or canned) and citrus fruit	9 lb.	7 lb.	4 lb.
Leafy, green and yellow vegetables	10 lb.	8 lb.	7 lb.
Dried beans and peas, peanut butter and nuts	½ lb.	1 lb.	2 lb.
Dried fruits	1 lb.	2 lb.	1½ lb.
Other vegetables and fruits	26 lb.	15 lb.	7 lb.
Eggs	2⅓ doz.	1⅓ doz.	1⅓ doz.
Lean meat, poultry and fish	11 lb.	7 lb.	4½ lb.
Flour and cereals			
Flour, corn meal, rice, macaroni products, and breakfast cereals, as well as corresponding quantities breads and baked goods	7 lb.	11 lb.	15 lb.
Fats: Butter, margarine, lard, oil, vegetable shortening, salt pork and bacon	3¼ lb.	3 lb.	3¼ lb.
Sugars: Sugar, jellies, jams, honey, syrups, and molasses	3 lb.	3 lb.	3¼ lb.
Accessories: Coffee, tea, cocoa, baking powder, soda, vinegar, salt, spices, etc.	80 cents worth	60 cents worth	45 cents worth

Foods included in the weekly diet of a family of four made up of two moderately active adults, a boy of 10 and a girl of 8. (Source: Farmers Bulletin No. 1757, U.S. Department of Agriculture)

How Age and Occupation Affect Food Consumption. Approximate weekly quantities of food comprised in an adequate diet at moderate cost

(Source: Farmers Bulletin No. 1757, U.S. Department of Agriculture)

	Child under 4 years	Boy 4 to 6 years; girl 4 to 7 years	Boy 7 to 8 years; girl 8 to 10 years	Boy 9 to 10 years; girl 11 to 13 years	Boy 11 to 12 years; girl over 13 years; moderately active woman	Active boy 13 to 15 years; very active woman	Active boy over 15 years	Moderately active man	Very active man
Milk: Fluid milk or corresponding quantities of canned or dried milk, or cheese	7 qt.	7 qt.	7 qt.	7 qt.	7 qt.[1]	7 qt.[1]	4½ qt.	3½ qt.	3½ qt.
Vegetables and fruits:									
Potatoes and sweet potatoes	1 lb. 12 oz.	2 lb.	2 lb.	2 lb. 4 oz.	2 lb. 8 oz.	3 lb.	5 lb. 12 oz.	3 lb.	6 lb. 12 oz.
Tomatoes (fresh or canned) and citrus fruit	1 lb. 8 oz.	1 lb. 8 oz.	1 lb. 8 oz.	1 lb. 12 oz.	1 lb. 12 oz.	2 lb.	2 lb.	2 lb.	2 lb.
Leafy, green, and yellow vegetables	1 lb. 4 oz.	1 lb. 8 oz.	1 lb. 12 oz.	2 lb.	2 lb. 4 oz.	2 lb. 4 oz.	2 lb.	2 lb.	2 lb.
Dried beans and peas, peanut butter, and nuts	.....	2 oz.	3 oz.	3 oz.	3 oz.	8 oz.	8 oz.	8 oz.	12 oz.
Dried fruits	1 oz.	3 oz.	5 oz.	6 oz.	8 oz.	8 oz.	12 oz.	12 oz.	12 oz.
Other vegetables and fruits	1 lb. 12 oz.	2 lb.	2 lb. 8 oz.	3 lb.	3 lb. 8 oz.	5 lb. 8 oz.	6 lb.	5 lb. 8 oz.	5 lb. 8 oz.
Eggs	5 eggs	5 eggs	5 eggs	5 eggs	4 eggs	4 eggs	3 eggs	3 eggs	3 eggs
Lean meat, poultry, and fish	.....	8 oz.	1 lb. 4 oz.	1 lb. 8 oz.	1 lb. 12 oz.	2 lb.	2 lb. 12 oz.	2 lb. 8 oz.	3 lb.
Flour and cereals: Flour, corn meal, rice, macaroni, spaghetti, and assorted breakfast cereals, as well as corresponding quantities of white and whole-grain breads, other bakery goods, and crackers	1 lb. 2 oz.	1 lb. 8 oz.	2 lb. 4 oz.	2 lb. 8 oz.	2 lb. 8 oz.	3 lb. 4 oz.	4 lb. 4 oz.	4 lb.	5 lb. 8 oz.
Fats: Butter, margarines, lard, oil, vegetable shortening, salt pork, and bacon	3 oz.	4 oz.	8 oz.	11 oz.	12 oz.	14 oz.	1 lb. 6 oz.	1 lb. 2 oz.	1 lb. 8 oz.
Sugars: Sugar, jellies, jams, honey, syrups, and molasses	2 oz.	4 oz.	8 oz.	12 oz.	14 oz.	1 lb.	2 lb.	1 lb.	2 lb. 4 oz.

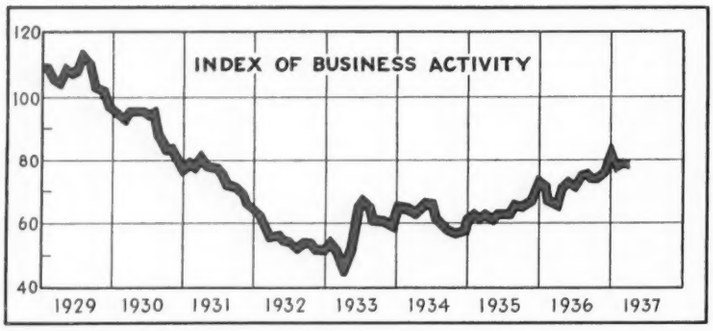


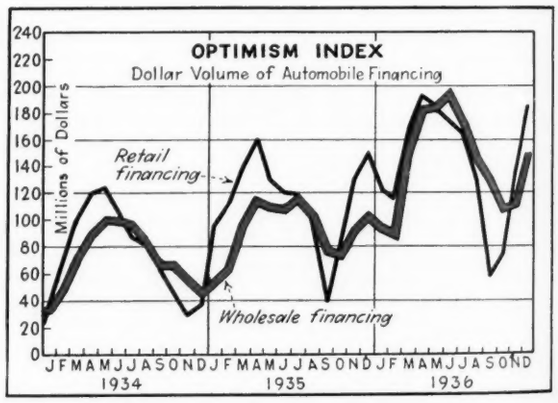
Changes in per capita consumption of six major foods and of all foods, 1910-1933

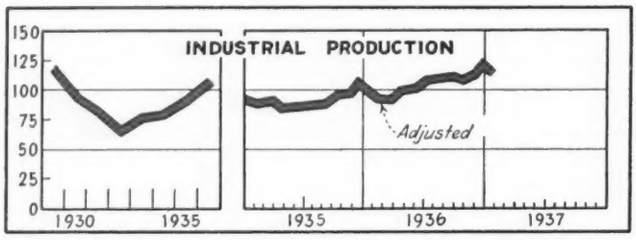
TRENDS That Affect the Food Industries

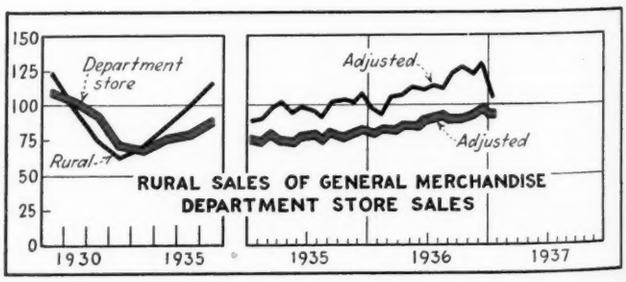
SUPPLY AND COST of raw materials for food manufacture, and the market for the finished products of the food industries, do not stand alone, isolated from the general operation of the national economy. Instead, they are an integral part of this economy, influenced by every change that occurs in any other part. Hence the trends exhibited by all of the accepted business indicators are clues by means of which the alert food manufacturer can foresee some of the things that will affect the future course of his own business.

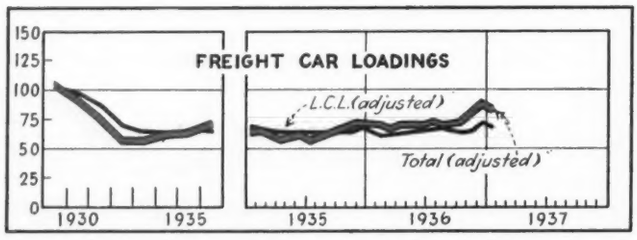
On this page some of the most useful of these business indicators are shown. The index of business activity is that compiled by *Business Week*. The "Optimism Index," from data of the U. S. Department of Commerce, shows the variations in retail and wholesale financing of automobiles. Because such financing tends upward when the consuming public looks to the future with confidence, this index serves to show the public attitude toward personal expenditures. The remaining indexes are a selection taken from the *Survey of Current Business*, published by the U. S. Department of Commerce and show general trends in industrial production, car loadings, building construction, sales of merchandise, and agricultural cash income.

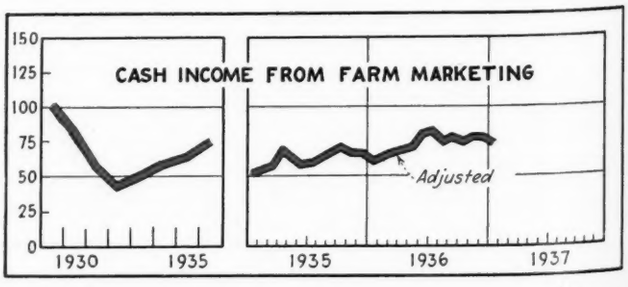


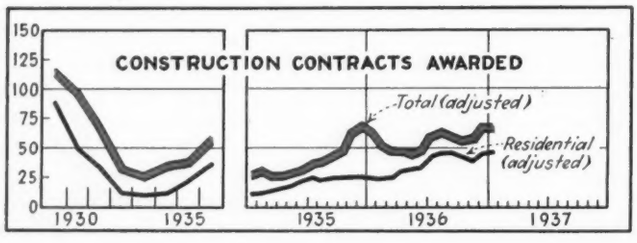

OPTIMISM INDEX
Dollar Volume of Automobile Financing
Millions of Dollars
Retail financing
Wholesale financing
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1934
1935
1936











A BALANCE SHEET for the Food Industries

AS THE MANUFACTURERS of food emerged from the trough of the depression, along with American industry in general, the combined balance sheet began to show improvement. When 1934 figures, the most recent income figures released by the Income Tax Division of the U.S. Treasury, are compared to 1932, it is noted that the receipts of the food industries increased by about $2 billion, while net profits rose in the same period from $32,000,000 to $371,000,000.

Reference to the tables on this page will show a marked increase in the number of tax returns filed with the U.S. Treasury. This increase, in large part, shows the result of Repeal.

Composite Balance Sheet of U.S. Food Corporations*, 1934

(Compiled from 14,133 Income Tax Returns)
(Preliminary—Subject to revision)

Assets	
Cash	$394,365,000
Notes and accounts receivable	911,853,000
Inventories	1,169,031,000
Investments	1,024,396,000
Land, buildings, equipment	2,700,221,000
Miscellaneous	485,692,000
	$6,685,557,000
Liabilities	
Notes and accounts payable	$976,639,000
Bonded debt and mortgages	597,125,000
Miscellaneous	442,943,000
Preferred stock	801,833,000
Common stock	2,476,831,000
Surplus and undivided profits (net).	1,390,178,000
	$6,685,557,000

* Includes liquors and beverages, alcoholic and non-alcoholic.

Composite Operating Summary of the U.S. Food Industries*, 1934

(Compiled from 14,133 Income Tax Returns)
(Preliminary—Subject to revision)

	%	
Receipts		
Gross sales	97.88	$9,099,744,000
Gross receipts from other operations	.58	54,478,000
Interest	.21	19,550,000
Rents	.17	16,026,000
Profit, sale of capital assets.	.04	3,973,000
Miscellaneous receipts	.67	61,803,000
Dividends, etc. (tax exempt)	.45	42,323,000
	100.00	$9,297,897,000
Disbursements		
Cost of goods sold	77.20	$7,164,531,000
Compensation of officers	1.14	105,165,000
Interest	.63	58,803,000
Taxes, not on incomes	1.18	109,497,000
Bad debts	.38	35,562,000
Depreciation	1.83	170,132,000
Depletion	.03	234,000
Other deductions	13.81	1,282,479,000
		$8,926,402,000
Compiled Net Profit	3.80	371,495,000
	100.00	$9,297,897,000

* Includes liquors and beverages, alcoholic and non-alcoholic.

Growth of the Food Industries as Indicated by Incomes and Deficits

(Compiled from income tax returns for 1934—Last two horizontal lines are preliminary — Subject to revision).

(Money figures in thousands of dollars)

Year	Total number of returns	Returns showing net income: Number	Gross income[2]	Net income	Tax	Returns showing no net income[1]: Number	Gross income[2]	Deficit	Returns showing no income data—Inactive corporations[1]
1923	13,590	8,388	7,499,284	411,716	43,812	5,202	1,528,149	118,480	.....
1924	13,924	8,841	9,742,291	443,370	51,822	5,083	1,044,576	91,897	.....
1925[3]	14,722	9,303	11,476,443	533,472	66,587	5,419	1,923,747	91,512	.....
1926	15,008	8,950	10,553,213	475,074	61,429	6,058	1,762,832	93,052	.....
1927	15,079	8,971	8,524,432	461,046	59,049	5,461	4,188,757	85,716	647
1928	14,965	8,844	11,551,431	518,092	58,391	5,405	1,497,403	77,818	716
1929	15,124	9,045	9,641,960	540,186	56,309	5,380	3,854,726	87,721	699
1930	14,847	7,897	7,637,397	436,451	49,869	6,328	4,377,338	128,498	622
1931	14,632	6,466	5,365,954	326,910	36,823	7,524	3,988,705	203,478	642
1932	14,968	3,629	4,430,704	199,387	25,201	10,653	2,858,953	207,211	686
1933[4]	15,828	5,145	6,021,007	337,969	47,105	9,582	1,856,300	100,603	1,101
1934[4]	16,645	6,742	7,825,332	399,976	55,195	8,690	1,579,215	66,853	1,213

[1] Prior to 1927, returns for inactive corporations showing no income data were included with returns showing no net income.
[2] Gross income corresponds to total income as reported on face of the return, plus the cost of goods sold.
[3] Includes "Tobacco products."
[4] Includes liquors and beverages, alcoholic and non-alcoholic.

Gross Incomes, Net Incomes and Deficits of Corporations in the Food Manufacturing Industries, 1934

(Compiled from income tax returns for 1934—Preliminary—Subject to revision)

(Money figures in thousands of dollars)

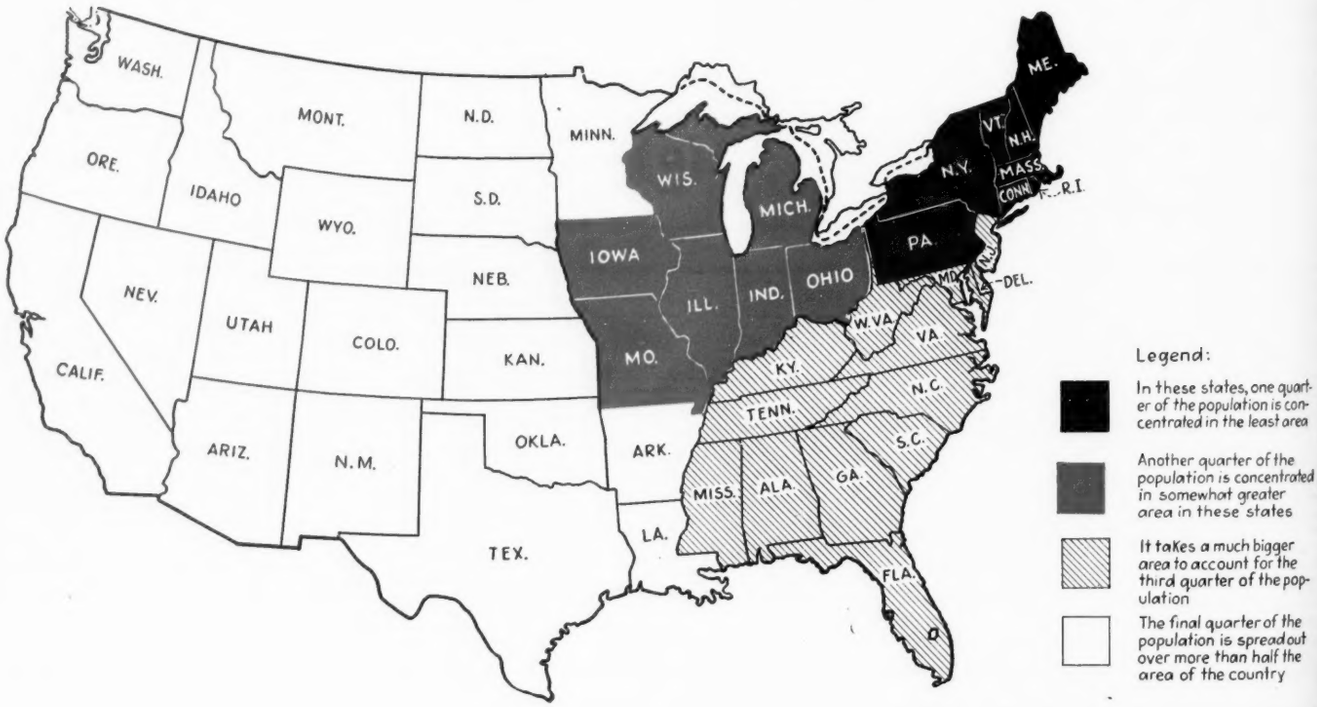
	Total number of returns	Returns showing net income: Number	Gross Income[1]	Net Income	Income Tax	Excess profits Tax[2]	Returns showing no net income: Number	Gross Income[1]	Deficit	Returns showing no income data
Manufacturing:										
Food and kindred products:										
Bakery and confectionery products	4,044	1,199	873,132	61,014	8,387	93	2,593	339,095	15,132	252
Canned products	1,935	875	624,805	51,995	7,150	193	914	126,554	5,477	146
Mill products	1,284	630	877,631	31,240	4,297	82	557	146,873	2,793	97
Packinghouse products	961	457	2,803,808	45,875	6,476	117	473	312,553	7,991	31
Sugar — beet, cane, maple and products	195	81	500,530	33,731	4,638	15	93	78,918	4,196	21
Other food products	4,943	2,132	1,293,909	78,473	10,820	142	2,520	367,317	15,540	291
Total food and kindred products	13,362	5,374	6,973,816	302,328	41,768	642	7,150	1,371,310	51,130	838
Liquors and beverages:										
Soft drinks — cider, mineral, etc.	1,744	790	121,316	16,734	2,301	111	885	39,959	2,439	69
Liquors — wines, beers, etc.	1,539	578	730,200	80,914	11,126	291	655	167,945	13,284	306
Total liquors and beverages	3,283	1,368	851,516	97,648	13,427	402	1,540	207,905	15,723	375

[1] Gross income corresponds to total income, as reported on face of return, plus " cost of goods sold " and " cost of other operations." Interest received on Liberty Bonds, etc. (item 11 on face of return) has been deducted from gross income, so that gross income includes the same items as in prior years.
[2] Includes excess-profits tax of $1,323 on returns with no net income since credit for interest received on certain obligations of the United States and its instrumentalities is not allowed against net income in the computation of excess-profits tax. (See article 1 (d) of Treasury Decision 4469, " Regulations relating to the excess-profits tax imposed by section 702 of the " Revenue Act of 1934.")

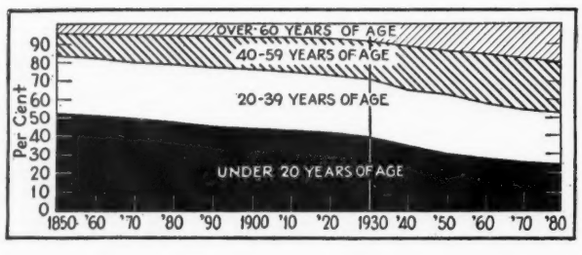
POPULATION FACTORS
Affecting Food Consumption

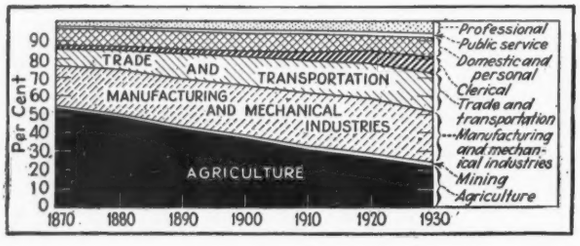
CONSUMERS OF FOOD are equivalent to the population of a country, when viewed in the broadest way. Hence the size of the population, its geographical concentration, what it does for a livelihood, and the age groups which go to make it up, are important basic factors in the planning of any food distribution activity. The information on this page, coming from the United States Department of Agriculture and the United States Department of Commerce, gives the general outline of the population picture in the United States.

Concentration of population of the United States, which, in 1936, was estimated to total 128,429,000.

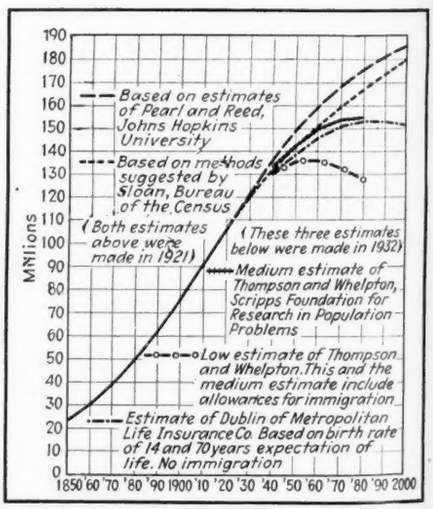


Consumption of food varies in volume and kind according to the age of the consumer. What age groups have made up the population of the United States in the past, and what these age groups are likely to be in the future, according to estimates of Thompson and Whelpton, is shown in this chart.





Manual workers eat the most and the heaviest foods, while brain workers tend to eat less food and to concentrate more on fruits and vegetables, so that this picture of shifts in occupation of that part of the population that is over sixteen years of age is a clue to changes in the national diet.


Millions
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1850 '60 '70 '80 '90 1900 '10 '20 '30 '40 '50 '60 '70 '80 '90 2000
Based on estimates of Pearl and Reed, Johns Hopkins University
Based on methods suggested by Sloan, Bureau of the Census
(Both estimates above were made in 1921)
(These three estimates below were made in 1932)
Medium estimate of Thompson and Whelpton, Scripps Foundation for Research in Population Problems
Low estimate of Thompson and Whelpton. This and the medium estimate include allowances for immigration
Estimate of Dublin of Metropolitan Life Insurance Co. Based on birth rate of 14 and 70 years expectation of life. No immigration

Estimates of various authorities as to trends of future population growth in the United States.